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TEXAS AGRICULTURAL EXPERIMENT STATION

BULLETIN NO. 189

JUNE, 1916

DIVISION OF CHEMISTRY

The Composition of Cotton Seed Meal and Cotton Seed



POSTOFFICE:
COLLEGE STATION, BRAZOS COUNTY, TEXAS

AUSTIN, TEXAS
VON BOECKMANN-JONES CO., PRINTERS
1916

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The Composition of Cotton Seed Meal and Cotton Seed

BY

G. S. FRAPS, Ph. D.,
Chemist in Charge; State Chemist



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*As of June 1, 1916.

**In cooperation with United States Department of Agriculture.

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THE COMPOSITION OF COTTONSEED MEAL AND COTTON SEED

BY

G. S. FRAPS, CHEMIST TO THE EXPERIMENT STATION.

This bulletin contains a discussion of the composition of cottonseed meal sold in Texas and in other States, with a description of the method of milling and with some discussion of the effect of milling on the composition of the meal. Some work on the composition of cotton seed is also given.

According to Bulletin 131, Bureau of the Census, in 1914 there were 885 cottonseed oil mills in the United States, of which 233, or 27 per cent., were in Texas. They crushed a total of 4,847,628 tons of cotton seed, of which 1,191,508, or 26.5 per cent., were crushed in Texas. The comparative amounts and values of the products are given in Table 1.

TABLE 1.—COTTONSEED STATISTICS.

	United States	Texas	Texas Per Cent
Seed crushed, tons.....	4,847,628	1,191,508	26.5
Oil, gallons.....	193,333,019	41,349,603	21.4
Meal and cake, tons.....	2,217,378	538,752	24.3
Hulls, tons.....	1,402,909	367,090	26.2
Linters, pounds.....	334,116,513	92,970,687	27.8
Oil, value.....	\$ 81,024,372	\$ 16,296,643	20.4
Meal and cake, value.....	56,093,519	13,348,620	20.4
Hulls, value.....	11,206,774	2,793,628	24.9
Linters, value.....	7,711,752	1,749,180	22.7
Total.....	\$ 156,036,417	\$ 34,188,071	

Although oil is the chief product of cotton seed crushing, yet its value is little more than 50 per cent. of the total value of the products in the United States, taken as a whole, and less than 50 per cent. in Texas. Cottonseed cake or meal has over one-third the value of the total output; so that it must be regarded as one of the main products of the industry, rather than a by-product.

DEFINITION OF TERMS.

The ordinary analysis of a feeding stuff gives its content of protein, ether extract (which is very often called fat or oil), crude fiber, nitrogen-free extract, water, and ash. The terms nitrogen and ammonia are also used frequently in connection with cottonseed meal. These terms are defined briefly in the following paragraphs:

Protein is an important constituent of the feed, containing 16 per cent. nitrogen, which is used largely to form flesh, muscle, and other similar portions of the animal body. When protein is fed in excess, it may also be used for fattening purposes, or for the production of heat.

Nitrogen is a constituent of protein, and protein is calculated by multiplying nitrogen by 6.25. The statement of the nitrogen content of a feed, or of cottonseed meal, is thus equivalent to stating the protein in different terms. By multiplying the protein by 0.16 it is converted into terms of nitrogen.

Ammonia as such is not contained in protein or in cottonseed meal, but nitrogen in protein may be expressed in terms of ammonia by multiplying nitrogen by 1.215. Ammonia may be converted into terms of nitrogen by multiplying by .882, or into terms of protein by multiplying by 5.15.

Fat, or oil, is the term usually applied to the ether extract of cottonseed meal. This substance is extracted by ether and is composed mostly of fats and oils. For factory-control purposes, the oil is extracted by means of petroleum ether. This method gives somewhat lower results than the method of extracting with ethyl ether, which must necessarily be used by Feed Control Officials.

Fats and oils are used in the animal body as a source of body heat and to furnish heat and energy. Fat contains more heat or energy per pound than nitrogen-free extract or carbohydrates, having about 2.25 times the value of the digested portions of these.

Nitrogen-free Extract is a group containing a number of substances of widely different properties. In the case of cottonseed meal, it contains pentosans, a sugar known as raffinose, and some other substances. In the case of cottonseed hulls, it is composed of less valuable and less easily digested substances. The nitrogen-free extract that has been digested is used by the body for the purpose of supplying heat and energy, and for the production of fat.

Crude Fiber is that portion of the feed which is left after it has been subjected, first to the action of boiling 1½ per cent. sodium hydroxide, and then to the action of boiling 1½ per cent. sulphuric acid. The pure kernel of cotton seed is low in crude fiber, while the hull is high in crude fiber. The digested crude fiber has some value to the animal for producing heat, but the work involved in digestion is so great that in many cases the animal really secures no benefit from the digestion of crude fiber. The more crude fiber a feed contains, the poorer is its quality, compared with other feeds of the same character.

Ash is the residue left when the substance is burned. It consists largely of lime, magnesia, and other non-volatile constituents, as well as some carbon held in the form of carbonate.

Water is present in all feeding stuffs. A high water content is liable to cause damage to the feed by heating or fermentation, especially in warm weather. The greater the percentage of water, the lower are the percentages of other ingredients.

Productive Value. The productive value of a feed is the quantity of fat it will produce on a fattening animal, when added to a ration already sufficient to support the animal. By fat, we do not mean gain in weight, but actual fat.

Feeding Value. The feeding value of a feeding stuff may be expressed in terms of its content of digestible protein and its productive value. The former represents its value for the production or repair

of flesh; the latter its value as a source of heat, energy, or fat. An animal requires much more productive value than it does digestible protein. (For discussion, see Bulletin 170.)

PRODUCTS FROM COTTON SEED.

Table 2 contains the quantities of the various products secured from cotton seed, as calculated from the United States Census Reports and from Bulletin 131, Bureau of the Census. The report in the tenth census (1880) is evidently only an estimate.

TABLE 2.—PRODUCTS FROM A TON OF COTTON SEED.

		Meal lbs.	Oil lbs.	Hulls lbs.	Lint. lbs.	Loss lbs.	Oil gal.
U. S. Tenth Census,	1879.....	750	250	978	22	0	
U. S. Twelfth Census,	1899.....	713	288	943	23	33	38.0
U. S.	1904.....	813	300	725	35	127	40.0
U. S. Thirteenth Census,	1909.....	875	301	663	46	115	40.1
U. S.	1914.....	915	299	579	69	138	39.9
Texas 1899 (U. S. Census)	.....	730	264	948	23	35	35.2
Texas 1904 (U. S. Census)	.....	788	280	780	39	113	37.3
Texas 1909 (U. S. Census)	.....	864	224	743	51	68	36.5
Texas 1914 (U. S. Census)	.....	904	261	616	78	141	34.7

The table shows an increase in the quantity of meal, and of lint secured since 1880, and a decrease in the quantity of hulls. There is no evident increase in the quantity of oil since 1899 for Texas, and since 1904, for the entire country. This is not what we should expect from the results of the chemical analysis of the cottonseed meal, as it contains less oil than formerly. The lower quantity of oil is, however, offset to some extent by the larger yield of meal.

The increase in lint is due to its more thorough removal from the seed. The increase in meal is due partly to changes in methods, partly to the manufacture of products of lower grade. The decrease in hulls is chiefly due to the fact that more of them get into the meal but also to the fact that they are more closely delinted.

COMPOSITION OF TEXAS MEAL.

The average cottonseed meal on the Texas market has decreased in feeding value since 1907, when the amended feed law went into effect. This is shown in Table 3, which contains the average composition of Texas cottonseed meal, as shown by analyses made for the Feed Control from July 1, 1907, to January 1, 1916, averaged in periods of six months. These averages include both cottonseed cake and cottonseed meal.

TABLE 2.—AVERAGE PERCENTAGE COMPOSITION OF TEXAS COTTON SEED MEAL SAMPLES, COLLECTED BY FEED INSPECTORS.

	Protein	Fat	Crude Fiber	Nitrogen Free Extract	Water	Ash	No. Samples	Digestible Protein	Productive Value
July 1, 1907-Jan. 1, 1908..	47.65	9.73	6.50	23.74	6.62	5.76	266	41.07	19.28
Jan. 1, 1908-July 1, 1908..	47.89	8.94	6.91	23.79	6.86	5.61	158	41.28	18.87
July 1, 1908-Jan. 1, 1909..	47.42	8.99	6.78	25.05	6.05	5.71	159	40.88	19.04
Jan. 1, 1909-July 1, 1909..	44.86	9.09	7.65	26.34	6.24	5.81	98	38.67	18.78
July 1, 1909-Jan. 1, 1910..	47.41	9.13	7.66	23.37	6.90	5.53	212	40.87	18.78
Jan. 1, 1910-July 1, 1910..	45.75	8.91	7.85	25.15	7.09	5.25	74	39.44	18.63
July 1, 1910-Jan. 1, 1911..	46.54	8.98	7.66	25.07	6.49	5.26	223	40.12	18.83
Jan. 1, 1911-July 1, 1911..	45.55	8.87	8.15	25.22	6.97	5.28	112	38.95	18.39
July 1, 1911-Jan. 1, 1912..	46.59	8.79	7.78	24.60	6.76	5.48	184	40.16	18.63
Jan. 1, 1912-July 1, 1912..	45.21	8.33	8.79	24.77	7.42	5.48	163	38.65	17.92
July 1, 1912-Jan. 1, 1913..	44.87	8.57	8.91	25.64	6.66	5.35	174	38.36	18.13
Jan. 1, 1913-July 1, 1913..	44.79	8.37	9.22	25.13	7.15	5.34	189	38.30	17.87
July 1, 1913-Jan. 1, 1914..	45.14	8.51	9.52	24.05	7.33	5.45	140	38.59	17.86
Jan. 1, 1914-July 1, 1914..	44.46	8.50	10.05	23.52	7.90	5.57	130	37.70	17.46
July 1, 1914-Jan. 1, 1915..	45.42	8.08	8.61	25.14	7.07	5.68	208	38.83	17.89
Jan. 1, 1915-July 1, 1915..	44.19	7.86	9.39	25.46	7.34	5.76	185	37.78	17.56
July 1, 1915-Jan. 1, 1916..	43.71	7.38	10.62	25.35	7.41	5.53	257	37.07	16.98

An examination of the table shows a decrease in protein and in fat, and an increase in nitrogen-free extract and crude fiber. The ash content is little variable and the water content shows a slight increase.

There is a general tendency for the protein and fat to be higher and the crude fiber to be lower during the first six months of the season. The lower per cent. of protein and fat found during the second six months is accompanied by a higher amount of crude fiber, but this increase in crude fiber is not always in proportion to the decrease in protein over the first six months. In 1908-9, for example, during the first six months of the season, cottonseed meal averaged 47.42 protein and 8.99 fat; while, during the second six months, the average was 44.86 protein and 9.09 fat. In the first period, the average percentage of crude fiber was 6.78; while during the second period it was 7.65. Thus a decrease of 2.56 per cent. in protein is accompanied by an increase of only 0.87 per cent. crude fiber. This indicates that the seed worked during the second period contained a smaller per cent. of protein than the seed worked during the first period. A similar difference in the seed is indicated in some of the other periods.

An increase in the crude fiber in cottonseed meal means an increase in the quantity of cottonseed hulls present. An examination of the table shows a steady increase in crude fiber. There has thus been, on an average, an increase of cottonseed hulls present in cottonseed meal sold in Texas. The average Texas feeders in 1915 received cottonseed meal that contains considerably less protein and more hulls than was received by the feeders in 1907. The guaranteed value is also less, since most of the meal is now sold as *prime*, rather than *choice*.

The decrease in quality is, of course, accompanied by a decrease in feeding value. This is also shown in the table. The digestible protein decreases from 41.07 to 37.07, and the productive value, expressed as fat, decreases from 19.28 to 16.98. The decrease in quality is due

to improved methods of manufacture, and to the retention of hulls in the meal for the purpose of manufacturing prime rather than choice meal. That is to say, in 1907-8 a large proportion of the mills were making choice meal, containing about 55 per cent. protein and fat combined; but in 1915-16, only a small number of mills were making choice meal, while most of them were endeavoring to make prime meal, containing 51 per cent. protein and fat combined. The tendency is for cottonseed meal to decrease in feeding value until it reaches the minimum permitted by the State laws, or other controlling influences.

CHANGES IN QUALITY IN OTHER STATES.

The decrease in average quality of cottonseed meal observed in Texas also may be found to occur in other States when a sufficiently long period of time is taken into consideration.

TABLE 4.—AVERAGE COMPOSITION OF SOUTH CAROLINA COTTONSEED MEAL.

Season—	No. of Samples	Ammonia Per Cent
1890-1.....	30	8.37
1891-2.....	25	8.21
1892-2.....	20	8.40
1893-4.....	22	8.64
1894-5.....	33	8.19
1895-6.....	34	8.45
1896-7.....	40	8.69
1897-8.....	39	8.39
1898-9.....	40	8.25
1899-1900.....	52	8.73
1900-1.....	60	8.55
1901-2.....	49	7.93
1902-3.....	69	8.08
1903-4.....	57	7.92
1904-5.....	62	7.42
1905-6.....	71	7.51
1906-7.....	99	7.32
1907-8.....	114	7.40
1908-9.....	115	7.27
1909-10.....	133	7.20
1910-11.....	177	7.26
1911-12.....	153	7.54
1912-13.....	171	7.37
1913-14.....	188	7.28
1914-15.....	90	7.21

South Carolina.—Table No. 4 shows the average composition of samples of South Carolina cottonseed meal collected under the fertilizer law, as given in Bulletin No. 181 of the South Carolina Experiment Station. The average composition from 1890-1 to 1900-1 shows no decrease, but varies irregularly from 8.19 per cent. ammonia (42.17 protein) in 1894-5 to 8.73 per cent. ammonia (44.96 protein) in 1899-1900. After 1900-1, when the average ammonia was 8.55 per cent, there was a decrease until approximately 1908-9 (7.27 per cent. ammonia, or 37.44 per cent. protein), after which year the average is again somewhat irregular. To judge by other States, the decrease will continue until the average is very near the minimum permitted by the State law, namely. 7.0 per cent. ammonia or 36 per cent. protein.

TABLE 5.—AVERAGE PERCENTAGE COMPOSITION OF LOUISIANA COTTONSEED MEALS.

Year.	Protein	Fat	Crude Fiber	Nitrogen Free Extract	Water	Ash
1906-7.....	42.22	8.87	8.05	25.72	8.12	7.02
1907-08.....	40.88	9.84	9.22	24.58	8.75	6.73
1908-9.....	41.96	8.96	8.87	25.56	8.14	6.51
1909-10.....	42.12	8.30	9.47	26.19	7.26	6.66
1910-11.....	40.74	8.16	9.29	27.43	7.71	6.67
1912-13.....	39.26	8.06	11.16	27.68	7.51	6.43
1913-14.....	39.07	8.25	12.04	26.54	7.82	6.28

Louisiana.—Table No. 5 shows the average composition of Louisiana cottonseed meal, compiled from Feed Control bulletins of the Experiment Station, or of the Department of Agriculture. The average protein content of Louisiana meal decreases from 42.32 per cent. in 1906-7 to 39.07 per cent. in 1913-14. The crude fiber increases from 8.05 in 1906-7 to 12.04 in 1913-14. During this period there has been an average increase of about 4 per cent. crude fiber or about 9 per cent. hulls. It is to be expected that the decrease in quality will continue until some effective check is interposed.

Massachusetts.—Table No. 6 shows the average composition of cottonseed meal sold in Massachusetts as given in Bulletin No. 158 of the Massachusetts Experiment Station. There is a very large decrease in protein, from 46.02 in 1907 to 40.2 per cent. in 1914, and an increase in crude fiber from 5.08 per cent. in the first period to 9.04 per cent. in the last period. This is an increase of 3.06 per cent. crude fiber or about 8 per cent. hulls. Unless some other check is interposed, the decrease in quality may continue until the Interstate minimum of 36 per cent. protein is nearly reached, when the crude fiber would average about 13.4 per cent. The demand for *prime* or *choice* meal may also interpose a check.

TABLE 6.—COMPOSITION OF COTTONSEED MEAL SOLD IN MASSACHUSETTS.

Year	No of Samples	Protein Per Cent	Fat Per Cent	Fiber Per Cent
1897-1902.....	93	46.2	11.2	5.8
1902-1906.....	190	45.4	9.6	6.4
1906-1911.....	85	42.0	9.2	7.3
1911.....	30	41.0	8.2	7.7
1912.....	64	41.0	7.7	8.4
1913.....	87	40.2	7.7	9.2
1914.....	50	40.2	7.6	9.4

Other States.—Table No. 7 shows the average composition of various cottonseed meals sold in other States. We have not attempted to collect averages for a sufficiently long period to show the changes discussed above. The average composition of cottonseed meal quoted from the "Cotton Plant" represents analyses made before 1900. They show a high protein and fat content and a very low crude fiber content as compared with the recent analyses given in the table. The

high fat content (14.23 per cent.), of course, means a great loss of valuable oil due to incomplete extraction, and the decreased oil content shown by recent analyses shows decided improvements in the methods of extraction. The increase in crude fiber shows the presence of an increased quantity of hulls.

TABLE 7.—COMPOSITION OF VARIOUS COTTONSEED MEALS.

	No. Samples	Protein	Ether Extract	Crude Fiber	Nitrogen Free Extract	Fat	Water	Ash
The Cotton Plant (to 1890).....		44.09		5.16	20.85	14.23	8.62	7.05
The Cotton Plant all Meal 400.....		43.28		5.44	22.31	13.45	8.52	7.02
New York, 1911 for 1910.....	26	40.25	8.03	9.11				
New York, 1912 for 1911.....	36	41.16	8.29	6.99				
New York, 1913 for 1912.....	34	40.70	8.26	8.31				
New York, 1914 for 1913.....	17	39.81	7.55	9.89				
New York, 1915 for 1914.....	23	40.65	7.71	8.97				
New Jersey, 1909-10.....		39.12	8.08	8.61				
New Jersey, 1910-11.....		40.05	8.49	7.83				
New Jersey, 1911-12.....		39.70	7.98	8.25				
New Jersey, 1912-13.....		40.30	7.98	8.86				
New Jersey, 1913-14.....	14	40.40	7.86	8.55				
Pennsylvania, 1906.....	9	41.21	9.09					
Pennsylvania, 1907.....	11	39.16	9.55	10.16				
Pennsylvania, 1908.....	24	41.75	8.79	8.39				
Pennsylvania, 1909.....	34	41.41	8.69	8.15				
Pennsylvania, 1910.....	47	40.11	8.18	8.73				
Pennsylvania, 1911.....	53	41.19	8.34	8.65				
Pennsylvania, 1912.....	87	40.87	8.44	9.53				
Pennsylvania, 1914.....	83	40.88	7.97	10.11				
Kentucky, 1914.....		40.90	7.79	9.95				
North Carolina, 1906-7.....		38.31						
North Carolina, 1908-9.....		39.95						
North Carolina, 1912-13.....	144	38.50						
Georgia, 1913-14 (fertilizer).....	144	41.87						
Georgia Feed, 1911-12.....	17	38.11	7.64	10.46	30.22			
Georgia Feed, 1912-13.....	27	38.43	8.62	9.92	28.23			
Georgia Feed, Nov., 1913-1915.....	32	38.34	7.65	9.36	31.51			

The average New York analyses, average from the Experiment Station bulletins, show an almost stable condition with regard to protein and crude fiber. These are quite similar to the analyses averaged from the New Jersey Experiment Station bulletins. The analyses made in Pennsylvania from bulletins of the Department of Agriculture, with the exception of 1907, show an increase in crude fiber. In the case of North Carolina, with the exception of 1906-7, the average composition reached several years ago the minimum of 7.5 per cent. ammonia permitted by the fertilizer law. The average Georgia analyses made under the fertilizer law are somewhat above the minimum of 7.5 per cent. ammonia permitted by the fertilizer law, but the averages made under the foregoing law are below the minimum of 7.5 per cent. ammonia or 38.63 per cent. protein.

Table No. 8 shows the average composition of cottonseed meal made in some Georgia mills during August and September according to a statement of the Picard-Law Company, Atlanta, Georgia, printed in the Oil Miller, October, 1915. The analyses do not represent the larger mills, which have their own chemists. The number of mills that were represented in August and September, 1915, was 54; while

the number represented in previous years was not given. A decrease in the quality of cottonseed meal as shown by the ammonia content is clearly shown. Meal sold in Georgia may not contain less than 7.5 per cent. ammonia. These analyses show that considerable quantities of a product below the Georgia requirements have been made in Georgia during August and September for a number of years. This meal may have been exported to foreign countries or to States that have a lower protein requirement than Georgia, and not sold as cottonseed meal in Georgia contrary to Georgia law.

TABLE 8.—COMPOSITION OF GEORGIA COTTONSEED MEAL IN AUG.-SEPT.

Aug.-Sept.	Moisture Per Cent	Oil Per Cent	Ammonia
1911.....	9.18	8.36	7.25
1912.....	9.13	7.96	7.12
1913.....	9.46	7.51	7.39
1914.....	9.17	7.38	7.46
1915.....	9.40	6.61	7.05

CAUSES OF DECREASE IN QUALITY.

The decrease in quality of cottonseed meal is due to two causes.

First. It is due to improvements in the process of oil milling, leading to a better separation of meats from the hulls and a better extraction of oil from the cake.

Second. It is due to the control of the hull content of the meal for the purpose of making meal of the desired protein (nitrogen or ammonia) content, or protein and fat content.

These two topics will be discussed in subsequent pages.

DESCRIPTION OF THE PROCESSES OF OIL MILLING.

In order to discuss properly the improvements in the processes of oil milling, it is necessary to have a description of the process of oil milling.

One Description.—The following is one outline of the process of crushing cotton seed:

The seeds are unloaded from the cars and placed in piles upon the floor of the warehouse. In some cases, they are distributed in several places, and thus mixed with other seeds; in other cases, the different kinds are piled separately. The seeds are taken first to machines, which remove dust, dirt, cotton bolls, trash, loose lint, etc., the valuable portions being saved. The amount of dirt and trash is, in some cases, considerable. Dirt and trash removed from the cotton during the process of ginning are sometimes mixed with the seed by the ginner. This is now prohibited in Texas by the warehouse law.

The seeds are then *reginned*, once or more, for the purpose of removing some of the short lint adhering to them. Under ordinary conditions this lint is worth $\frac{1}{2}$ to 1 cent per pound, but during war conditions, it has been worth as much as 7 cents per pound, as it is used in the manufacture of gun cotton. The seed may be reginned

moderately, or closely, or several times. The lint secured in the close reginning is so short that it is ordinarily of low value, and under normal conditions its removal is not often profitable.

The seed next go to the *hullers*. They consist of a series of knives revolving on a disc or cylinder against a fixed knife. The hullers cut the seed so that the kernels may drop out. Two hullers are usually used, but sometimes only one. When two hullers are used, the first one cuts most of the seed. The second one cuts the remainder and grinds the hulls so that the desired amount of hull-bran goes in with the kernels. The adjustment of the knives is varied to suit the size of the seed, the cut desired in the first huller, and the amount of grinding desired in the second. With three hullers, the introduction of hull-bran is still more easily regulated. With only one huller, it is difficult to cut all the seed properly; either there is a loss of oil, by absorption by the lint or hulls, or loss of meats, due to uncut seed.

The first huller should cut the hull only, so that the entire kernel drops out, but of course a certain proportion of the kernels are cut. If the kernels are cut too much or are mashed by dull knives or wrong adjustment during the hulling, oil is absorbed by the hulls or the lint on the hulls, and fine particles of the kernels stick to the hulls or are mashed into them or the lint. The result is a loss of oil due to *absorption*. Close delinting is said to reduce loss of oil by absorption. The mixture of the hulls, kernels, and uncut seed from the first huller go to the *first shaker*, which carries perforated metal screens, which are usually flat and vibrate by shaking. In going over the screens, the hulls felt together, and the kernels drop through the perforations and are conveyed to the rolls. The sizes of the perforations are adjusted to the kind of seed and the grade of meal desired. The Atlanta Utility Works, on page 7 of the Oil Miller for February, 1915, and elsewhere, advertise shakers with "Removable sash to regulate the ammonia."

When the seed are closely delinted, there is difficulty in separating, which is sometimes overcome by the use of unperforated metal before the screens in the first shaker, which permits the hulls to felt together before they reach the perforations.

The hulls and uncut seeds from the first shakers go to the *first beaters*. These are a cylindrical screen containing revolving paddles which beat the material, knock out the kernels and permit them to fall through the perforations of the screen. The kernels usually fall upon a second flat screen, which makes a further separation of kernels from hulls. The kernels go into the conveyor to the rolls. The tailings from the first beater go to the *second huller*. The knives of this huller are set sufficiently close to cut all the seed that pass the first huller, and also to grind the hulls, so as to put a sufficient quantity of hulls in with the kernels to make the desired composition.

The Carver Company make the following statement in regard to second hulling:

"In the process of Cotton Seed Oil Milling where it is desired to do double hulling, or regrind the hulls to obtain hull-bran, the Disc Huller is the proper machine for this work. At this point in the progress of the product through the mill there should be very little

of the cottonseed meats or meals in the hull; in fact, if the previous operations have been performed efficiently, the amount of meats should not be above 1 or 2 per cent. This, therefore, allows for the efficient use of the disc huller, its abrasive action being just what is desired to grind the hull to a fine state, thus producing a product that allows of a separation giving hull-bran and hull; but, due to the low percentage of meats, the absorption loss becomes negligible."

The product of the second huller falls upon the *second shaker*, consisting of vibrating screens like those of the first shaker, but with different perforations. The kernels and hull-bran go into a conveyor to the rolls. The hulls go to a *second beater* similar to the first beater. The hulls from this machine go to the hull house and the product, consisting of hull-bran, with very little kernels, goes to the rolls.

The mixture of kernels and hull-bran from the first and second shaker and the first and second beater go to the rolls, where they are crushed into thin flakes, for the purpose of rupturing the oil cells.

They then go to the *cookers*, where they are cooked by steam under a pressure varying from 100 pounds to 30 pounds, for about forty minutes. In case of a very dry seed, some water may be added before the kernels are cooked. In case of damp seed, there is a loss of moisture during the cooking.

The cooked product is then formed into cakes, covered with cloth made of camel's hair and placed in hydraulic presses. The oil is then expelled by means of hydraulic pressure in presses usually holding 16 press boxes, and the residue consists of a hard slab of cottonseed cake about $\frac{1}{2}$ inch thick, 32 inches long, and 14 inches wide, weighing about 13 pounds. When meal is desired, the cake is first broken up in a *cake breaker*, and then ground to a fine meal.

The above is known as the *hydraulic process*, which is the usual process. In the *expeller process* (sometimes called cold-pressed process), the kernels and hull-bran are separated as described above; and then, without previous cooking, the oil is expelled by passing the mixture through the expeller, where it is subjected to intense pressure by means of rolls. The rolls and the product become hot during the expression. This product is in the form of flakes, but is similar in chemical composition to hydraulic cottonseed cake or meal. It should not be confused with cold pressed cotton seed (so-called), which is made from the entire seed from which the hulls have not been removed, and therefore contains a large percentage of hulls.

Another Description. The following is a description of another modification of the process, as given in Catalogue No. 75 of the Bauer Bros. Company:

"The illustration on pages 22 and 23 shows a complete hulling and separating plant in connection with which the 'scientific' hull retaining process is used. It will require but little explanation to enable the practical Oil Mill man to understand the process as shown. The conveyor bringing the seed from the linters is continued over the top of all machines, dropping and passing the seed through the huller, which is the first machine in the installation, and it must be so adjusted that the hulling plates will cut all the seed as in an ordinary

single hulling plant. This adjustment is quickly accomplished by means of the temper screw at the end of the shaft. The 'scientific' patented deflecting valve is located above the top screen, which must be so adjusted that 50 per cent of the product from the huller is immediately passed to the bottom screen, the remaining portion being evenly distributed over the top screen.

"The meats from both screens are delivered to a 9-inch conveyor located on the floor, and passing under the discharge of all the separating machines in the system. The tailings from the double shaker are dropped into another 9-inch conveyor located on the floor and running parallel with the meats conveyor referred to above, and by this conveyor delivered into the boot of the elevator which returns them to the conveyor above the separator. The meats recovered by this machine are also delivered into the meats conveyor, joining the meats from the first double shaker. The tailings from this beater are delivered into the outside hull conveyor, and carried to the boot of the second elevator and again returned to the conveyor above the machines, and by it delivered to the second disc machine, which is equipped for retreating the hulls.

"The purpose of this retreating process is threefold:

"1. To produce just the right amount of good, clean hull-bran to control the ammonia content of the meal.

"2. To remove from the hulls all meats that may be adhering to them by reason of imperfect hulling.

"3. To recover any whole seed that may, by accident, have escaped the huller.

"The steel frame shaker beneath removes a large percentage of the hull-bran, which product is discharged into the meats conveyor, joining the meats recovered by the preceding machines. The tailings are dropped into the outside conveyor and delivered into the boot of the third elevator, which again returns them to the conveyor above the machines which delivers them to the finishing beater, where all the remaining hull-bran and fine floury meats are recovered and dropped into the meats conveyor on the floor, then passing on to the rolls, the finished hulls being conveyed to the hull house, or to the extingisher."

A Superintendent's Outline. The following outline of cotton seed manufacture is taken from a paper read by F. E. Voorhees in the Proceedings of the Oil Mill Superintendents' Association, June, 1913:

"1. *Character of Seed and Its Influence Upon the Yield and Quality of the Oil.*—We all know the cotton plant requires from five and a half to six and a half months for maturity. The various conditions prevent a uniform quality of seed. Thus we have from the picking, unripe, half ripe, and ripe seed. The three kinds make it a study to store seed for oil. Quality of seed is a most important consideration in an oil mill, for the quality of the raw material determines not only the quality of oil expressed, but the percentage yield of oil as well. Inferior seed usually produces inferior crude oil, and it takes skill to work inferior with good seed and it involves great danger to the quality. Seed ought to be graded and milled separately. Different locations furnish more or less moisture to the seed, but seed obtained from

the first picking contain more moisture than seed picked later in the season.

"2. *Classification*.—Seed should be classified according to its degree of maturity. The riper seed is the superior; as the unripe seed is inferior, so is wet, musty, and rotten seed; it is composed of unstable organic compounds, and when in bulk it has a great influence on heating. To have prime seed, it should be sacked.

"3. *Storage*.—Seed that has undergone any amount of heating will not produce prime oil. For this reason, in storage, seed sacks ought to be used. Many places do not sack the seed on account of storage capacity. In sacks it requires from 90 to 95 cubic feet per ton and in bulk or loose only 85 cubic feet, and when packed, only 65 cubic feet, but no matter, seed must be kept cool and dry.

"4. *Handling Seed*.—The drier the seed, the easier it is to handle them and less apt to clog the spouts and passageways.

"5. *Cleaning*.—This is the foundation for the proper handling of the material for the press room. The seed is received contaminated with various amounts of foreign matter, such as bolls, flocks of lint, pebbles, sand, twigs, leaves, nails, bolts, metal, etc., which must be removed: all oil mills must be equipped with ample cleaning machinery. In the preliminary mechanical treatment of the raw seed, the loss in weight arises from two sources, viz.: separation of mixed foreign matter and separation of material. Moisture of the seed is about 6 per cent. of the weight of the original seed, but conditions will increase the loss.

"6. *Regrinding or Delinting*.—We must have the linters well set with sharp saws, for a good delinting helps the hulling and the separation.

"*Hulling*.—Hulling is a very difficult process, the dryer the seed is the better the hulling is done, for when thoroughly dry and free from all excess of lint it is not so hard to accomplish. The hull is easily broken and the meat is loose and drops out of the cracked hull; but when the seed is not well matured, damp and soft, the hull will not break but mashes. It is hardly possible to get the meats from the hulls. Seed must be cut but not mashed. It is why in the new oil mill practice we use with such effectual results, I mean the use of the disc huller, which the cutting edges of the plates have the proper method of cutting, instead of mashing the seed, and eliminate a great deal of that oil absorption, and after that process is gone through, some well-built shaker receives the mess of cut seed which is treated in its travel and causes the meats to fall through perforations of a mesh 3-16-inch for 8 feet and $\frac{1}{4}$ -inch the last 2 feet for a first treatment.

"7. *Separating Meats and Hulls*.—When seed is hulled, enough lint must remain on it; the lint adhering to the hulls that remain with the meats causes them to felt together in wads. They are tossed upon the shaker, which prevents them from falling through with meats when sifted out. Many mills are installed with a regrinder; that is, a second disc huller is installed and receives the hulls and unseparated seed from the first shaker treatment. This process is acknowledged to be of great value, for it positively reduces the oil in the hulls

to less than 1 per cent., and clears the hulls of practically all meats; it produces a maximum cake and meal free from objectionable lint, and it furnishes the desired percentage of hull-bran, and regulates the ammonia content of the meal. It enables you to manufacture a cake to any class you desire it—choice, prime, or a very low grade of protein meal.

"8. *Crushing*.—The purpose of crushing is to rupture the oil cells and to so break down the structure of the kernel that all parts may be equally exposed to heat in the cooking process, whereby the mass is thoroughly and uniformly softened to permit the freest egress of the oil in the press. Crushing rolls must be ground true and even; it is important to operate them properly and uniformly and always keep an uninterrupted feed on the rolls; a hasty, irregular, or intermittent feeding affects materially the yield of oil in the press. A common practice in many mills is that the sweepings of uncrushed kernels are put in the rolls. Under no circumstances should it be done. Let it be returned to the separator shaker and not allowed to go in with the crushed meats when the meats are uniformly soft and crushed. The cooking is more efficiently done and the oil separation in the press easily done and in large quantities. Improperly crushed meats mean inefficient cooking. Inefficient cooking means a low yield of oil of inferior quality and wasteful use of press cloths. Inferior oil means large waste on refining and reduces yields of refined oil. Too much stress cannot be laid upon the care with which each step in the manipulation of the seed is performed.

"9. *Cooking Meats*.—If the efficient performance of one step in the preparation of cottonseed oil is more important than another, or if there is one in which the character of the seed has a greater determining influence upon the yield and quality of the product, it is cooking. Cooking is modifying the consistency of the meats through heat, that the maximum yield of oil may be expressed. The coagulation of the albumin expels the excess of natural moisture by absorption and reduces the meats to the consistency desired for the best results."

EFFICIENCY OF THE MACHINERY.

Walter Leonard, in the Proceedings of the Oil Mill Superintendents' Association, June, 1913, states:

"In our modern press rooms, with improved and scientific methods, we are able to make from 800 pounds to 1000 pounds of cake of any desirable chemical analysis. It is possible to regulate the ammonia content, protein and fat, and other constituents to a point that will deviate but a small percentage from an agreed-upon standard."

J. C. Newberry, in the Proceedings of the Oil Mill Superintendents' Association, 1913, says:

"By having your perforations graded closely, you can regulate your ammonia, protein, and fat very closely. As I have stated before, I have my equipment so arranged that if the office sees fit to sell anything from 45 to 55 per cent. meal, I can make the necessary changes within a short time."

By "45 to 55 per cent. meal," he means that which contains 45 to 55 per cent. protein and fat combined.

COMPOSITION OF INTERMEDIATE PRODUCTS.

Table No. 9 shows the composition of some intermediate products obtained during the process of oil milling. No attempt has been made to collect a large number of these products. The products of the first huller and shaker consist almost entirely of cottonseed kernels; while products of the second huller, which come from the second shaker and the second beater, contain a large quantity of hulls or hull-bran.

TABLE 9.—COMPOSITION OF INTERMEDIATE PRODUCTS.

Laboratory Number.		Protein	Fat	Crude Fiber	Nitrogen Free Extract	Water	Ash
11124	Product of first shaker.	35.63	29.62	5.50	17.98	6.80	4.47
11129	Product of first shaker.	36.75	30.94	4.67	17.03	5.77	4.84
11991	Product of Second shaker.	19.19	14.48	23.74	31.43	7.68	3.48
11125	Product of second shaker.	17.72	9.03	25.23	33.77	7.34	6.91
11130	Product of second shaker.	31.19	24.91	10.91	21.96	6.55	4.48
11126	Product of second beater.	10.38	5.99	33.27	37.61	9.63	3.12
11131	Product of second beater.	16.53	11.63	26.78	33.51	8.26	3.29

IMPROVEMENTS IN PROCESSES OF MILLING.

Improvements in recent years in processes of manufacture, leading to a better separation of meats from the hulls and better extraction of oil from the cake, have caused a decrease in the oil content of cottonseed meal, and perhaps, to a limited extent, an increase in its hull content, with a consequent increase in crude fiber.

The improvements are due largely, if not entirely, to control exercised by means of chemical analysis over the final products, and, when necessary, over the operation of the various machines. The improvements relate to *absorption* of oil, *separation* of kernels, and *extraction* of oil.

Absorption.—Considerable quantities of oil were formerly lost through absorption by the hulls. This was largely due to the mashing of the seed during the hulling, through the use of hullers with knives not properly set or not sharp enough. It was also due to the use of only one huller. When only one huller is used, it must be set close enough to cut practically all the seed, and as the seed vary somewhat in size, the huller must be set somewhat close. When the huller is thus set, all the kernels are cut, and oil is absorbed from the cut surfaces, and some of the material is rubbed into the lint or hulls. Thus with seed not uniform in size, cut on a single huller, there is likely to be either losses by absorption, or losses due to incomplete separation of the hulls from the seed.

At present, in mills where the amount of absorption is ascertained often by chemical analysis of the hulls, it has been reduced to practically zero. This is due not only to the use of the second huller but

to experience in the details of adjusting the hullers, the screens, and the beaters to suit the character of the seed being worked. Sometimes an estimation is made of oil in the hulls from each of the various machines to ascertain at what stage oil is lost by absorption.

The principle involved in preventing absorption is to cut the minimum amount of kernels and to separate the bulk of the kernels from the hulls as quickly as possible. This is done in the first huller and through the first shaker. In many cases, a large proportion of the kernels are not cut at all, the hulls being cut in such a way as to allow the whole kernel to fall out. When lint is closely removed, it is often advisable to have the mixture of kernels and hulls fall first on unperforated metal, so that the hulls may felt together before reaching the perforations.

Separation.—When the separation is incomplete, uncut seeds and parts of kernels go into the hulls. Hulls now made contain practically no whole seed. This is partly due to the use of two hullers instead of one, and partly to attention to details of setting the huller knives and other machine adjustments.

On account of better separation, cottonseed hulls, as now made, contain much less protein and fat, and more crude fiber, and nitrogen-free extract, than those formerly made, and analyses made several years ago no longer represent the cottonseed hulls on the market. On account of the closer adjustment of the second huller required to cut all the seed, and make a complete separation, somewhat more hulls must necessarily go in with the meats than was formerly the case. The recent reduction of the quantity of lint of the hulls reduces the percentage of crude fiber in the hulls.

Extraction.—Cottonseed meal as made before 1890 contained, on an average, 13.45 per cent. oil. (Table No. 7.) Cottonseed meal made in Texas from July 1 to January 1, 1907-8 (Table No. 3) contained 9.73 per cent. fat, or oil. This is a decrease of 3.72 per cent., or 74.4 pounds per ton of meal, or nearly 10 gallons of oil per ton of meal, or about 4.4 gallons per ton of seed. If the oil is worth about 6 cents a pound, and the meal $1\frac{1}{2}$ cents, the gain in oil and the loss in meal at $4\frac{1}{2}$ cents per pound would represent about \$3.35 per ton of meal, or about \$1.45 per ton of seed.

The average oil content of the Texas meal from July 1 to January 1, 1907-8, was 9.73 per cent., and from January 1, 1915, to July 1, 1915, it was 7.86 per cent. This is a decrease of 1.87 per cent. fat, and is an increase of 37.4 pounds per ton of meal, or about 5 gallons per ton of meal, or 2.2 gallons per ton of seed, or \$1.63 per ton of meal, or \$0.81 per ton of seed at the prices given above.

It is said that some mills controlled by frequent chemical analysis of the meal have averaged 5.7 per cent. fat during the past year. If one allows 0.3 per cent. for the difference in extraction with petroleum ether used in mill control work, the amount of oil will be 6 per cent. according to Feed Control methods, or a further possible average decrease of 1.86 per cent. This would be a gain of 37.2 pounds of oil per ton of meal, which is about the same as the average decrease which occurred from 1907-8 to 1915; and, at the prices given,

would amount to \$1.63 per ton of meal or \$0.81 per ton of seed. In a crush of 1,191,508 tons of seed in Texas, this would be over \$960,000.00.

The value of the increase due to the reduction of oil would, of course, vary with the relative prices secured from meal and oil. In some cases, these are materially below the figures used.

The possibility of such a result is shown in Table No. 10, which contains daily analyses which a mill in Texas had made for control purposes. The average fat content during the period given is 6.10. It requires, however, frequent analyses to secure such results.

TABLE 10.—PERCENTAGE COMPOSITION OF CAKE OF AN OIL MILL ON DIFFERENT DAYS.

Date	Protein	Oil	Moisture
October 20, 1915.....	44.20	8.29	11.00
October 21, 1915.....	42.87	5.24	8.75
October 22, 1915.....	43.38	5.63	8.04
October 25, 1915.....	43.90	5.62	8.76
October 28, 1915.....	43.07	6.08	9.00
October 29, 1915.....	45.80	5.90	8.15
November 1, 1915.....	44.56	6.38	8.65
November 2, 1915.....	46.31	6.55	9.90
November 3, 1915.....	43.33	6.11	8.58
November 20, 1915.....	42.92	6.78	8.50
November 27, 1915.....	43.84	6.06	8.70
December 1, 1915.....	45.65	6.47	8.42
December 6, 1915.....	42.20	5.77	10.75
December 11, 1915.....	42.92	5.50	9.30
December 14, 1915.....	43.23	5.98	9.25
December 17, 1915.....	43.90	5.88	9.30
December 23, 1915.....	42.97	5.95	8.60
December 31, 1915.....	45.59	5.64	9.00
Average (18).....	43.70	6.10	9.03

The improvement in the extraction of oil shown above may be ascribed to better attention to all the details of manufacture, including the rolling, cooking, and pressing, as well as other processes, due largely to the check or pressure produced by the chemical analysis of the products, upon the carefulness and attention of the superintendents.

This is emphasized by H. G. Hawk in an article read before the Oil Mill Superintendents' Association, June, 1913, as follows:

"So lastly we just want to notice the fact that for scientific press room work such as getting a high grade of oil, $7\frac{1}{2}$ per cent. ammonia cake or any standard we desire, and a cake that will only contain $2\frac{1}{2}$ per cent. or 3 per cent. of oil will require the well-trained eye, the touch and all that go to make up scientific press room work; will require about all the energy, close observation, and practice most of us care to put out."

It is claimed by some oil mill men that the presence of a certain amount of hulls with the meal insures better drainage and a more complete extraction of the oil. This is discussed in a later section.

ANALYTICAL CONTROL OF OIL MILLING.

Analytical control of oil milling is exercised through analysis of the seed, the cake or meal, the hulls, and, when necessary, the intermediate products of the manufacture.

Seed.—Analysis of the seed is made for the purpose of ascertaining the possible yields of oil, cake, and hulls of the desired composition so as to adjust the machinery as may be necessary. It is also made for the purpose of ascertaining the localities which produce seed of a high oil content. Lint may be estimated on the seed before and after reginning to test the efficiency of the delinting process.

Cake or Meal.—Cake or meal is analyzed for protein, fat, and moisture, to see that it comes up to the necessary guarantee, to check the processes of manufacture, and to see that as much oil has been secured as is possible. If the cake or meal is below guarantee, it may be brought up to the guarantee by mixing it with a product of higher analysis. If the oil is running high, it shows that the superintendent must exercise more care in the press room work.

Hulls.—Hulls are analyzed for uncut seed, for kernel particles, and for oil. The object is to see if any seed or kernel particles have escaped the machinery, or if any absorption of oil has taken place, and to make the necessary changes in such event.

Intermediate Products.—When losses by absorption of oil, or by escape of meats or uncut seed cannot be checked, analysis may be made of the tailings from the various machines to test their efficiency and to ascertain where the trouble occurs. By proper means such loss may be then checked.

Oil.—Oil is sold on analysis, and the analysis is made for trade purposes rather than for control purposes.

Weights of Products.—A well controlled mill will have arrangements for weighing the oil and cake secured from each period's run of seed. A decrease in oil output may then be quickly ascertained, and checked, if not due to the low oil content of the seed.

RELATION OF CRUDE FIBER TO EXTRACTION OF OIL.

It is claimed by some oil mill men that the presence of hulls or hull-bran makes the cottonseed cake more porous and permits a better extraction of oil in the hydraulic presses. This claim was advanced in justification of the addition of hulls to cottonseed meal in excess of a limited amount.

Granting that a certain amount of hull-bran is needed for drainage, the pertinent question is whether the quantity needed exceeds the equivalent of 9 per cent. crude fiber, and, if so, to what extent?

Beyond the assertions of the oil mill men referred to above, little evidence has been offered in regard to this matter.

Mr. Law, President of The Picard-Law Company, in the Oil Miller, October, 1915, has the following to say:

"Press room work, especially in Georgia, is excellent. Twelve of the fifty-four mills rendering meal samples show an average oil left in the cake which is less than 80 per cent. of the ammonia percentage, and the total average is 92 per cent. This strengthens our contention that the best press room work is obtained in the Southeast under modern milling methods when the meal shows between 7 and 7.25 per cent. ammonia. Here is a comparison of September work for the past five years." (See Table No. 8, page 12.)

An examination of the table referred to shows that the average oil content of the meal decreases regularly from 8.36 to 6.61; whereas, the ammonia content of the meal varies irregularly from 7.46 to 7.05. The highest ammonia content is associated with next to the lowest oil content, and the highest oil content with the third from the lowest ammonia content. Thus the decrease in oil from 8.36 to 6.61 per cent. is not associated regularly with decreased ammonia, but is due to other causes (better control).

The following is contained in an editorial in *The Oil Miller*, October, 1915:

"Hulls, or fiber, so-called, in the meal or raw meats enter materially into the determination of economical manufacturing of cottonseed oil. There is a point somewhere around 7 per cent. ammonia meal at which the cost of producing oil reaches the minimum. Just at what point has not been definitely determined, but it requires a given amount of hull or hull-bran in the meats to insure the highest degree of drainage in the mass being pressed." The 7 per cent. ammonia refers to meal made in Georgia, which is made from seed containing less protein than the seed grown in Texas.

B. W. Couch, President of the Texas Cottonseed Crushers' Association, stated, in reply to a question, at a public hearing on cottonseed products November 2, 1915, that equally as good yields of oil could be secured when making Texas choice meal as when making Texas prime meal. He went on to explain that while the percentage of oil in the choice meal might be a little higher, the yield of cake would be less; so that the total yield in gallons of oil would be the same. He also stated that an excess of hulls caused a loss of oil.

A number of other oil millers have returned a similar reply to this question, and have stated that they secure equally as good yields of oil when making choice meal as when making prime Texas meal.

The fact that the cake may contain a smaller percentage of oil, but the yield of oil may be the same, or less, due to a larger total production of cake, is explained as follows by Thomas C. Law, of Atlanta, Georgia, in an article in *The Oil Miller*, September, 1913:

"Our standard on meal reports is figured so as to put all mills on an equal basis. The only way of doing that is to figure as near as possible the pounds of meal made per ton of seed from the ammonia which the meal contains. Of course, the higher the ammonia the smaller the yield of meal, and vice versa. We adopted for a standard 900 pounds of meal, showing $7\frac{1}{2}$ per cent. ammonia per ton of seed. We adopted for a standard press room efficiency 6 per cent. of oil in meal when ammonia is $7\frac{1}{2}$ per cent.; in other words, the oil per cent. should be 80 per cent. of the ammonia per cent.

"Now take, for example, two reports on meal; one shows 6.85 per cent. ammonia and 6.26 per cent. oil, the other 8.22 per cent. ammonia and 7.42 per cent. oil. The last is the best press room work. Its standard is 0.90, while the first is 0.91. Here is the reason: First our standard which shows that 900 pounds of $7\frac{1}{2}$ per cent. meal containing 6 per cent. oil, means that 54 pounds of oil is left in cake per ton of seed. If you get 900 pounds of $7\frac{1}{2}$ per cent. ammonia meal, you should get 985 pounds of 6.85 per cent. ammonia meal.

This meal contains 6.26 per cent. oil, which means that there are 61.66 pounds of meal left in cake per ton of seed. By the same method meal running 8.22 per cent. ammonia will produce 821 pounds. This meal contains 7.42 per cent. oil, which means that 60.91 pounds of oil is left in cake per ton of seed, more in the latter case than the former."

The meal referred to above is Eastern meal, and of lower quality than that made in Texas. The method is not strictly correct, as it assumes that all seed have the same composition.

Landon C. Moore, a commercial chemist of Dallas, Texas, stated at the hearing held at College Station on November 2, 1915, by the Feed Control Service that while one mill made cake containing 43 per cent. protein and 11 per cent. crude fiber, another mill, in another section, made, from poorer seed, cake containing 43 per cent. protein and 4 per cent. crude fiber. He was asked particularly if the separation and extraction were good, and replied that they were good in both cases. According to this statement, a difference of 7 per cent. in the crude fiber made little or no difference in the extraction of the oil. This illustration also shows how well a mill can remove hulls from the cake if it is necessary to do so.

Table No. 11 shows the comparative average composition of Texas and Louisiana meals.

TABLE 11.—COMPARATIVE FAT AND FIBER CONTENT OF TEXAS AND LOUISIANA MEALS.

	Fat		Louisiana corrected for ex- cess hulls	Crude Fiber	
	Texas	Louisiana		Texas	Louisiana
1907-8.....	9.40	9.84	10.40	6.70	9.22
1908-9.....	9.03	8.96	9.32	7.10	8.87
1909-10.....	9.08	8.30	8.57	7.76	9.47
1910-11.....	8.93	8.10	8.35	7.90	9.29
1912-13.....	8.47	8.06	8.44	9.07	11.16
1913-14.....	8.50	8.25	8.65	9.77	12.04
1914-15.....	8.06			9.00	

The Texas meals averaged a higher percentage of fat and a lower percentage of crude fiber, except in 1907-8. In 1914-15, however, the Texas mills made meal with 9.0 per cent. crude fiber and 8.06 per cent. fat, doing as well as the Louisiana mills in 1912-13 or 1913-14 with a higher average of crude fiber.

The Louisiana mills also made a larger quantity of cake due to the larger amount of hulls present, the additional quantity of cake containing an additional quantity of fat and reducing the yield of oil.

This correction is made in the following way: Let us assume that one pound crude fiber equals $2\frac{1}{2}$ pounds of hulls. In 1907-8, Louisiana meal contained 2.52 per cent. more crude fiber than Texas meal, which is equal to 5.6 per cent. of more hulls. These hulls, however, contain the same quantity of fat as the meal, namely, 9.84 per cent., which is equal to 0.56 per cent. This correction should be added to the fat content of the Louisiana meal. The other corrections are made by the same method.

When this correction is made, it may be said that the extraction of oil was better in Texas than in Louisiana, in three of the six years, and nearly the same in 1912-13. In 1913-14, the Texas meal, with a much lower crude fiber content, averages a better extraction.

The evidence shows that the increased fiber content of Louisiana meals over Texas meals is not accompanied by a better extraction of oil.

An examination of Table No. 3, containing the average composition of Texas meals, shows a decrease in fat content for the season of 1914-15, and this decrease is accompanied by a lower average crude fiber content than during the previous seasons. In other words, the average decrease of fat in 1913-14 is not accompanied by an average increase in crude fiber.

TABLE 12.—COMPOSITION OF TEXAS COTTONSEED MEAL ARRANGED IN GROUPS ACCORDING TO FIBER CONTENTS 1907-1912.

	Protein	Fat	Crude Fiber	Nitrogen Free Extract	Water	Ash	Ratio Protein to Fat
To 6% average (432).....	49.02	9.87	5.14	23.62	6.33	5.69	0.201
6-7% average (350).....	48.28	9.34	6.48	24.15	7.01	5.63	0.193
7-8% average (315).....	46.88	8.74	7.46	24.50	7.65	5.55	0.186
9-10% average (173).....	44.81	8.24	9.57	25.32	6.85	5.39	0.184
10-11% average (122).....	43.86	8.15	10.30	25.66	7.00	5.42	0.186
11-12% average (71).....	41.66	8.02	11.27	26.46	7.01	5.29	0.192
Over 12% average (42).....	39.19	7.45	13.48	27.37	7.27	5.06	0.190

Table No. 12 contains the composition of Texas cottonseed meal from 1907 to December 31, 1912, averaged in groups according to the crude fiber content. In considering this table, one must bear in mind that the period is one of transition, in which decided improvements were made in the extraction of oil, both in Texas and in other States, and further that the proportionate quantity of prime meal (47 to 51 per cent. protein and fat) is greater during the latter parts of the period, while the proportion of choice (51 to 55 per cent.) is greater during the earlier part. Hence the association of reduced oil content with higher crude fiber content may be due to improved manufacturing conditions and to better chemical control, rather than to the fiber content. The lower fat content is associated with a higher fiber content. However, the table does not show a better extraction as the fiber increases, as increased fiber means more cake, which contains oil. The ratio of protein to fat decreases to 0.184 per cent., then increases, showing a loss of oil due to the additional hulls.

Table No. 13 shows the number of samples in the groups.

TABLE 13.—NUMBER OF SAMPLES OF TEXAS COTTONSEED MEAL, IN GROUPS ACCORDING TO FIBER CONTENTS 1907-1912.

	Below 7% Fat	7 to 8%	8 to 9%	9 to 10%	Over 10%
To 6% fiber.....	7	49	96	112	168
6-7% fiber.....	12	71	80	88	99
7-8% fiber.....	25	81	97	55	57
9-10% fiber.....	35	59	50	19	10
10-11% fiber.....	19	48	25	20	7
11-12% fiber.....	25	20	12	7	3
Over 12% fiber.....	20	12	5		

TABLE 14.—AVERAGE COMPOSITION OF TEXAS COTTONSEED MEAL IN GROUPS ACCORDING TO FAT CONTENTS.

	No. of Samples	Fat	Crude Fiber	Protein	Nitrogen Free Extract	Water	Ash
July 1, 1914 to Dec. 31, 1914.							
5-6% fat.....	5	5.68	10.48	44.56	25.28	8.46	5.54
6-7% fat.....	30	6.73	9.79	44.56	25.88	7.46	5.58
7-8% fat.....	88	7.54	8.72	45.60	25.29	7.14	5.71
8-9% fat.....	53	8.46	7.87	46.16	24.89	6.89	5.73
Over 9% fat.....	32	10.56	8.08	44.69	24.37	6.65	5.65
Jan. 1, 1915 to July 1, 1915.							
5-6% fat.....	6	5.76	13.02	41.04	26.52	8.15	5.51
6-7% fat.....	33	6.65	10.46	43.86	25.92	7.50	5.61
7-8% fat.....	70	7.49	9.22	44.88	25.23	7.43	5.75
8-9% fat.....	54	8.37	8.79	44.71	24.99	7.22	5.92
Over 9% fat.....	22	10.22	8.80	44.17	24.16	6.90	5.75
July 1, 1915 to Dec. 31, 1915.							
5-6% fat.....	19	5.53	13.16	41.31	26.61	7.96	5.39
6-7% fat.....	84	6.49	11.22	43.44	25.55	7.61	5.51
7-8% fat.....	97	7.48	10.09	44.30	24.87	7.26	5.57
8-9% fat.....	36	8.36	9.71	44.16	24.94	7.43	5.56
Over 9% fat.....	21	9.97	9.80	43.44	24.58	6.71	5.51

Table No. 14 shows the composition of Texas cottonseed meal from July 1, 1914, to December 31, 1915, arranged and averaged according to the fat content. It will be noted that a fat content of 5.68 per cent. is secured with 10.48 per cent. crude fiber in the period from July 1 to December 31, 1914; whereas, in later periods more crude fiber is associated with the low fat content. The second group (6 to 7 per cent. fat) is associated with 9.79 per cent. crude fiber one year, and with a higher content in later years.

TABLE 15.—AVERAGE CONTENTS OF SOUTH CAROLINA COTTONSEED MEAL (1913-1914).

Groups	No. of Samples	Per Cent Protein	Per Cent Fat	Per Cent Crude Fiber
6-7% fat.....	14	36.80	6.52	12.79
7-8% fat.....	41	38.23	7.52	10.50
8-9% fat.....	31	38.72	8.39	9.60
Over 9% fat.....	24	39.26	10.97	8.31

Table No. 15 shows the composition of South Carolina cottonseed meal as given in their bulletin for 1913-14, arranged and averaged in groups according to the fat content. The lower fat content is associated with a higher crude fiber content.

TABLE 16.—AVERAGE COMPOSITION OF LOUISIANA COTTONSEED MEAL IN GROUP ACCORDING TO FAT CONTENTS 1913-14.

Groups	No. Average	Protein	Fat	Fiber	Nitrogen Free Extract	Water	Ash
6-7% fat.....	4	39.40	6.68	11.20	27.63	8.09	6.94
7-8% fat.....	31	40.91	7.52	12.08	27.35	7.94	6.20
8-9% fat.....	24	38.16	8.38	12.18	27.13	7.75	6.30
Over 9% fat.....	14	40.03	10.09	11.95	23.71	8.04	6.18

Table No. 16 shows the composition of Louisiana cottonseed meal as given in the bulletin for 1913-14, arranged and averaged in groups according to the fat content. There is no relation between the fat content and the fiber content of the groups. The group with the lowest fat content has the lowest fiber content. The fiber content varies little, from 11.20 to 12.18.

Consideration of the data mentioned leads to the conclusion that it is possible to secure a low oil content of the cake when the crude fiber content is around 7 to 9 per cent., by means of a proper control of the manufacturing processes.

It seems to be somewhat easier, however, to secure a lower oil content when a somewhat larger percentage of crude fiber is present. That is to say, mills which do not exercise such rigid control of their work, reduce the oil content to a greater extent, when a larger amount of crude fiber is present. Under the ordinary manufacturing conditions, somewhat more crude fiber than 9 per cent. may lead to better extraction of oil in many cases. Thus while some mills are able to reduce the oil content to 5.5 per cent. with a fiber content of 8 to 9 per cent. (or even less), other mills seem to get better results when 9 to 11 per cent. is present. This accounts for the differences in opinion of the millers. The difference appears due to manufacturing conditions rather than to crude fiber. Nevertheless, the fact must be taken into consideration that 9 to 11 per cent. crude fiber in some mills appears to give a better extraction of oil. More evidence along this line is needed.

Some oil millers state that the amount of oil left in the cake depends upon the water content of the seed when it is crushed, and is independent of the quantity of hulls present. If the water content is high (8 to 12 per cent.), flinty cake is produced, which is low in oil (5 to 6 per cent.). If the water content is low, a soft cake is produced, which is high in oil and of good color. The water content is to some extent regulated by the conditions of cooking.

RELATION OF CRUDE FIBER CONTENT TO FEEDING VALUE.

Since the fertilizing value of cottonseed meal depends upon its content of nitrogen, available phosphoric acid, and potash, and since the hulls contain little nitrogen, the presence of hulls affects the fertilizing value of cottonseed meal in proportion as it decreases the nitrogen content.

The case is, however, different with the feeding value. The digestibility of the protein and other constituents, except the crude fiber, decreases as the quantity of crude fiber increases.

Cottonseed meal may be considered as being composed of the kernel residue and of the hulls. The kernel residue contains about 3 per cent. crude fiber and the hulls about 45 per cent. The amount of crude fiber is an indication of the amount of hulls present. Bulletin No. 166 contains digestion experiments with cottonseed meal, also with cold-pressed cotton seed and cottonseed meal and hulls. The average cottonseed meal used contains 7.5 per cent. crude fiber. The average quantity of crude fiber in the meal rich in hulls was 26 per cent. Table No. 17 shows the coefficients of digestibility for these separate products.

TABLE 17.—EFFECT OF CRUDE FIBER ON PRODUCTION COEFFICIENT OF THE MEAL.

	Protein	Ether Extract	Crude Fiber	Nitrogen Free Extract
Meal, coefficient of digestibility.....	86	95	15	72
Meal and hulls coefficient of digestibility.....	73	91	37	62
Difference for 18.50% crude fiber.....	13	4	-22	10
Difference for 1% crude fiber.....	0.7	0.2	1.2	0.5
Difference in production coefficient for 1% crude fiber.....	-.0016	-.0012	+.003	-.0013

The differences in the coefficients of digestibility are also given. By dividing the differences in digestibility by the differences in the crude fiber, we get the effect of 1 per cent. crude fiber upon the coefficient of digestibility, which is also given in the table. This may be calculated to the productive value. Thus an increase of 1 per cent. crude fiber gives the differences in the table. There is an increase in the productive value of the crude fiber. Using these figures, we have calculated the production coefficients of the various grades of cottonseed meal as given in Table No. 18. (For a discussion of the production coefficients, see Bulletin No. 185.)

TABLE 18.—PRODUCTION COEFFICIENTS OF COTTONSEED MEAL AND COTTON-SEED MEAL AND HULLS.

	Protein	Ether Extract	Crude Fiber	Nitrogen Free Extract	Coefficient of digestibility of Protein
With 7% crude fiber (6-8).....	0.203	.567	— .033	.181	86.2
With 9% crude fiber (8-10).....	.200	.565	— .027	.178	85.5
With 11% crude fiber (10-12).....	.197	.563	— .021	.175	84.8
With 13% crude fiber (12-14).....	.194	.560	— .015	.172	84.1
With 15% crude fiber (14-16).....	.190	.558	— .009	.170	83.4

Not only does the digestibility of the constituents decrease, but also the actual value to the animal decreases, on account of the increased expenditure of energy involved in the digestion of the crude fiber.

The decrease in productive value is estimated at 1.3 per cent. for each per cent. crude fiber.

An increase of crude fiber from 9 to 11 per cent. with no change in the other constituents will thus decrease the digestibility of the protein 1.6 per cent., and the productive value 2.6 per cent. Thus if two cottonseed meals have the same protein content, the one with the higher crude fiber will contain less digestible protein and have a lower fat-producing value.

It is of some interest to inquire, what proportion of the value of cottonseed meal comes from the different constituents. All the digestible protein, of course, comes from the protein. Table No. 19 contains the productive values calculated from the constituents of two grades of cottonseed meal. The negative value of the fiber is subtracted from the nitrogen-free extract in calculating the percentages.

TABLE 19.—COMPARATIVE PRODUCTIVE VALUES OF CONSTITUENTS OF TWO COTTONSEED MEALS.

	Meal A			Meal B		
	Compo- sition	Pro- ductive Value	% of Total	Compo- sition	Pro- ductive Value	% of Total
Protein.....	44.0	8.66	51.6	36.0	7.09	44.1
Fat.....	7.0	3.94	23.5	7.0	3.94	24.5
Crude fiber.....	10.0	— .21	.....	11.0	— .23	.....
Nitrogen free extract.....	25.0	4.37	24.8	30.0	5.25	31.3
Total.....		16.76	.....		16.05	.....

It is seen that from 44 to 51 per cent. of the value of these two extreme grades is in the protein, and that from 69 to 75 per cent. is in the protein and fat combined.

STANDARDS FOR COTTONSEED MEAL.

Standards for cottonseed meal adopted by the different States are as follows: The standards for North Carolina, South Carolina, Georgia and Alabama, have been in use for a number of years.

North Carolina.—Cottonseed meal must contain not less than 7.5 per cent ammonia. This is practically the fertilizer law.

South Carolina.—Under the fertilizer law, cottonseed meal must contain not less than 7 per cent. ammonia. Under the South Carolina feed law, cottonseed meal must contain not less than 36 per cent. protein, 3 per cent. fat, and not more than 10 per cent. crude fiber (7.5 per cent. ammonia equals 36 per cent. protein, closely).

Georgia.—Under the fertilizer law, cottonseed meal must contain not less than 7.5 per cent. ammonia. Under the feed law, the standard adopted for cottonseed meal is 38.62 per cent. protein and 4.00 per cent. fat. The standard for crude fiber as published in the bulletins in 1911 to 1915 was 12 per cent., but in the bulletin published November, 1915, the requirement for crude fiber in cottonseed meal was eliminated.

Alabama.—Under the fertilizer law, cottonseed meal must contain not less than 7.5 per cent. ammonia. When it contains less, it must be sold as cottonseed meal and hulls, or low-grade cottonseed meal.

Texas.—From 1907 to 1916, cottonseed meal had to contain not less than 43 per cent. protein, or 50 per cent. protein and fat combined, and not more than 9 per cent. crude fiber. This has now been changed to not less than 44 per cent. protein, 51 per cent. protein and fat combined, and not over 11 per cent. crude fiber. (See below.)

Oklahoma.—According to a circular of the Oklahoma State Department of Agriculture, October 1, 1915, choice cottonseed meal must contain at least 42 per cent. protein and 5.5 per cent. fat and not more than 9.5 per cent. crude fiber; prime cottonseed meal must contain at least 38 per cent. protein and 5.5 per cent. fat, and not more than 11 per cent. crude fiber, and these standards have been approved by representatives of the Oklahoma Cottonseed Crushers' Association.

Pennsylvania.—The Pennsylvania State law does not permit more than 9 per cent. crude fiber in cottonseed meal.

CHANGE IN THE TEXAS STANDARD FOR COTTONSEED MEAL.

The Texas standard for cottonseed meal from 1907 to 1916 was that it should contain not less than 43 per cent. protein, not less than 50 per cent. protein and fat combined, and not more than 9 per cent. crude fiber.

A hearing on cottonseed products was held by the Feed Control Service on October 2, 1915, and was supplemented by letters submitted later. On February 15, 1916, the agreement given below was made between Director Youngblood and a committee of the Texas Cottonseed Crushers' Association. This agreement practically changes the emphasis in the Texas standard from crude fiber to protein, or protein and fat.

The following memorandum of understanding was agreed to by a committee of the Texas Cottonseed Crushers' Association and accepted by Director B. Youngblood:

"We, the undersigned, acting for and in behalf of the Texas Cottonseed Crushers' Association, have come to an understanding with

the Feed Control Service, on this the 15th day of February, 1916, at College Station, Texas, as follows:

"It is agreed that the definition and standards for cottonseed meal shall more nearly coincide with the rules of the Texas Cottonseed Crushers' Association, as follows:

"Cottonseed meal is composed of decorticated kernels of cotton seed, free from excess of hulls and other foreign materials. It must contain not less than 44 per cent. of protein, or not less than 51 per cent. of protein and fat combined, and not more than 11 per cent. of crude fiber.

"Cottonseed cake shall correspond to cottonseed meal in composition and as to standard.

"It is agreed that any deficiency in percentage of fat may be offset by additional percentage of protein, as, for instance, in cottonseed meal guaranteed to contain 5 per cent. of fat, 46 per cent. of protein would be required.

"It will be observed that the 51 per cent. of protein and fat combined coincides identically with the rule of the Texas Cottonseed Crushers' Association, and that the increase of 2 per cent. crude fiber gives the millers greater latitude in holding the standard for protein and fat.

"It is agreed that the standard for *choice cottonseed meal* shall remain as heretofore."

This committee consisted of Mr. B. W. Couch, President of the Texas Cottonseed Crushers' Association; Mr. Ed. Woodall, of Hillsboro, Texas, and Mr. W. F. Pendleton, of Farmersville, Texas, and Durant, Oklahoma.

While we have reason to believe that the majority of Texas cottonseed crushers are in favor of the agreement given above, and are satisfied with the definition now adopted, as shown by the definition adopted at their meeting in May, 1916, yet there are some few cottonseed crushers who desire to put on the Texas market a decidedly inferior product, containing less than 44 per cent. protein and correspondingly more hulls, under the name of cottonseed meal, and are not satisfied with the standard agreed upon. The Feed Control Service does not attempt to regulate what shall or shall not be manufactured in the State, but merely insists on the right of the purchaser to know what he is buying. Those desiring the lower standard, say that if the low grade product is sold under the name of cottonseed meal and hulls, that they cannot get as much for it as if it were sold as cottonseed meal. If this argument means anything, it means that the buyer will not pay as much for the goods if he knows what he is getting, as he would if he thought he was getting cottonseed meal. This is, thus, an argument in favor of the proper naming of the product, and not against it.

DEFINITIONS OF COTTONSEED MEAL.

UNITED STATES FEED CONTROL OFFICIALS.

The following definition of cottonseed meal has been adopted by the Feed Control Officials of the United States:

Cottonseed Meal is a product of the cottonseed only, composed principally of the kernel with such portion of the hull as is necessary in the manufacture of oil; provided, that nothing shall be recognized as cottonseed meal that does not conform to the foregoing definition and that does not contain at least 36 per cent. of protein.

Choice Cottonseed Meal must be finely ground, not necessarily bolted, of sweet odor, reasonably bright in color, yellow, not brown or reddish, free from excess of lint, and must contain at least 41 per cent. of protein.

Prime Cottonseed Meal must be finely ground, not necessarily bolted, of sweet odor, reasonably bright in color, yellow, not brown or reddish, free from excess of lint, and must contain at least 38.6 per cent. of protein.

Good Cottonseed Meal must be finely ground, not necessarily bolted, of sweet odor, reasonably bright in color, and must contain at least 36 per cent. of protein.

Cottonseed Feed is a mixture of cottonseed meal and cottonseed hulls containing less than 36 per cent. of protein.

INTERSTATE COTTONSEED CRUSHERS' DEFINITIONS.

The definitions (1915) adopted by the Interstate Cottonseed Crushers' Association are as follows:

Cottonseed Meal is a product of the cottonseed only, composed principally of the kernel, with such portion of the fiber or hull and oil as may be left in the ordinary course of manufacture, or as may be indicated by the analysis thereof, and shall be graded and classed as follows:

Provided, that nothing shall be recognized, traded in or sold as cottonseed meal that does not conform to the requirements above set forth, and that does not contain at least 36 per cent. of protein.

Choice Cottonseed Meal must be finely ground, not necessarily bolted, perfectly sound and sweet in odor, yellow, free from excess of lint, and by analysis must contain at least either 8 per cent. of ammonia, or 49 per cent. of combined protein and fat.

Prime Cottonseed Meal must be finely ground, not necessarily bolted, of sweet odor, reasonably bright in color, yellow, not brown or reddish, free from excess of lint, and by analysis must contain at least either 7.5 per cent. of ammonia or 46 per cent. of combined protein and fat.

Good Cottonseed Meal must be finely ground, not necessarily bolted, of sweet odor, reasonably bright in color, and by analysis must contain at least either 7 per cent. of ammonia, or 43 per cent. of combined protein and fat.

Cottonseed cake not coming up to contract analysis shall be a good delivery if within one-quarter of 1 per cent. of ammonia, or within $1\frac{1}{4}$ per cent. of combined fat and protein, guaranteed by contract or of sale sample, but the settlement price shall be reduced at the rate of one-tenth of contract price for each 1 per cent. and proportionately for fractions of deficiency in ammonia, or one forty-ninth, one forty-sixth, or one forty-third, as the case may be, for deficiency in protein and fat.

Where cake is sold on sample, to be a good delivery it must reasonably conform to the sale sample in color and texture and analysis.

TEXAS FEED CONTROL SERVICE DEFINITIONS.

The definitions of the Texas Feed Control Service are now as follows:

Cottonseed Meal is composed of the decorticated kernels of cotton seed, free from excess of hulls and other foreign materials. It must contain not less than 44 per cent. of protein, not less than 51 per cent. of protein and fat combined, and not more than 11 per cent. of crude fiber.

Prime Cottonseed Meal is composed of the decorticated kernels of cotton seed, free from excess of hulls and other foreign materials. Must be finely ground, of sweet odor, reasonably bright in color, and must contain not less than 44 per cent. of protein, 7 per cent. of fat (not less than 51 per cent. of protein and fat combined), and not more than 9 per cent. of crude fiber.

Choice Cottonseed Meal is composed of the decorticated kernels of cotton seed, free from excess of hulls and other materials. Must be finely ground, of sweet odor, reasonably bright in color, and must contain not less than 48 per cent. of protein, 7 per cent. of fat (not less than 55 per cent. of protein and fat combined), and not more than 9 per cent. of crude fiber.

Cottonseed Cake should correspond to cottonseed meal in composition.

Cottonseed Meal and Hulls is any mixture of cottonseed meal and hulls containing not less than 9 per cent. and not more than 20 per cent. of crude fiber.

Mixed Cottonseed Meal and Hulls is any mixture of cottonseed meal and hulls containing not less than 20 per cent. and not more than 40 per cent. of crude fiber. The percentage of hulls must be stated.

TEXAS COTTONSEED CRUSHERS' ASSOCIATION DEFINITIONS.

The definitions of the Texas Cottonseed Crushers' Association are as follows:

Cottonseed Cake is a product of the cottonseed only, composed principally of the kernel, with such portion of the fiber or hull and oil as may be left in the ordinary course of manufacture, or as may be in-

licated by the analysis thereof, and shall be graded and classed as follows:

Provided, that nothing shall be recognized, traded in or sold as cottonseed cake that does not conform to the requirements above set forth, and that does not contain at least 36 per cent. of protein; and further provided, that no cottonseed cake shall be offered for sale, for consumption in Texas, that does not comply with the State pure feed laws.

Choice Cottonseed Cake must be reasonably bright in color, sweet in odor, friable in texture, not burnt in cooking, free from excess of lint and hulls, and shall contain by analysis of a competent chemist 55 per cent. of protein and fat combined; provided, that it shall not be rejected if it contains as much as 51 per cent. of protein and fat combined; but an allowance shall be made by seller of one-fifty-fifth of the contract price less freight when sold delivered for each deficient unit of protein and fat combined.

Prime Cottonseed Cake must be of good color, yellowish, not brown or reddish, sweet in odor, firm in texture, free from excess of lint, and shall contain by analysis of a competent chemist 51 per cent. of protein and fat combined; provided, that it shall not be rejected if it contains as much as 47 per cent. of protein and fat combined; but an allowance shall be made by the seller of one-fifty-first of the contract price less freight when sold delivered for each deficient unit of protein and fat combined.

Sec. 2B. Cottonseed cake where sold for consumption in Texas shall contain not less than 44 per cent. of protein, or 51 per cent. of protein and fat combined, and must not contain more than 11 per cent. of fibre.

No claim for deficiency of protein and fat combined shall be made by buyer unless the variation shall equal or exceed one-half of one unit.

Cottonseed Meal is a product of the cottonseed only, composed principally of the kernel, with such portion of the fiber or hull and oil as may be left in the ordinary course of manufacture, or as may be indicated by the analysis thereof, and shall be graded and classed as follows:

Provided, that nothing shall be recognized, traded in or sold as cottonseed meal that does not conform to the requirements above set forth, and that does not contain at least 36 per cent. of protein; and further provided, that no cottonseed meal shall be offered for sale, for consumption in Texas, that does not comply with the State pure feed laws.

Cottonseed meal shall be graded as follows:

Choice Cottonseed Meal must be the product of sound cottonseed cake, finely ground, reasonably bright in color, not brown or reddish, free from excess of lint and hulls, and shall contain by analysis of a competent chemist 55 per cent. of protein and fat combined; provided, that it shall not be rejected if it contains as much as 51 per cent. of protein and fat combined; but an allowance shall be made by seller of one-fifty-fifth of the contract price less freight when sold delivered for each deficient unit of protein and fat combined.

Choice Bolted Cottonseed Meal must be the product of sound cot-

tonseed cake, finely ground and bolted, of bright yellow color, not brown or reddish, and shall contain by analysis of a competent chemist 55 per cent. protein and fat combined; provided, that it shall not be rejected if it contains as much as 51 per cent. of protein and fat combined; but an allowance shall be made by seller of one-fifty-fifth of the contract price less freight when sold delivered for each deficient unit of protein and fat combined. Meal to be *choice bolted* must be ground and bolted sufficiently fine for the contents to pass through a wire mesh of one-twenty-sixth of an inch in diameter.

Prime Cottonseed Meal must be the product of sound cottonseed cake, finely ground, of sweet odor, reasonably bright in color, not brown or reddish, reasonably free from excess of lint, and shall contain by analysis of a competent chemist 51 per cent. of protein and fat combined; provided, that it shall not be rejected if it contains as much as 47 per cent. of protein and fat combined; but an allowance shall be made by seller of one-fifty-first of the contract price, less freight where sold delivered, for each deficient unit of protein and fat combined.

Prime Bolted Cottonseed Meal must be the product of sound cottonseed cake, finely ground and bolted, of bright yellow color, not brown or reddish, and shall contain by analysis of a competent chemist 51 per cent. of protein and fat combined; provided, it shall not be rejected if it contains as much as 47 per cent. of protein and fat combined; but an allowance shall be made by seller of one-fifty-first of the contract price, less freight when sold delivered, for each deficient unit of protein and fat combined. Meal to be *prime bolted* must be ground and bolted sufficiently fine for the contents to pass through a wire mesh of one-twenty-fourth of an inch in diameter.

Sec. 4B. Cottonseed meal, where sold for consumption in Texas, shall contain not less than 44 per cent. of protein or 51 per cent. of protein and fat combined and must not contain more than 11 per cent of fiber.

No claim for deficiency of protein and fat combined shall be made by buyer unless the variation shall equal or exceed one-half of one unit.

PROTEIN REGULATION.

The valuation of different cottonseed meals by means of the protein, or protein and fat content, was adopted for the purpose of distinguishing between different grades of cottonseed meal, made by processes which had for their primary object the extraction of the oil. The meal varied in composition, both on account of differences in the seed, and differences in the hull content, due to imperfections in manufacturing. With the development of this method of valuation, and with the development of chemical methods of mill control, the manufacturer found that, though he was in many cases penalized for meal running below the guarantee, he received no extra payment when meal was above guarantee. He thus formed the impression that the ammonia (or protein) and fat was the only valuable constituent of the feed, and the remainder of the feed had little or no value. In other words, he was selling protein or protein and fat. These con-

siderations lead naturally to introduction of hulls during the process of manufacture, where needed to run the protein content down to the minimum guarantee. Where the protein, or protein content served only as a basis for judging the quality of meal, questions as to the hull content, or whether the product was really a cottonseed meal, did not often arise. The rules of the Interstate and other Cottonseed Crushers' Associations in fact permit the addition of cottonseed hulls or hull-bran, either during the process of manufacture or otherwise. This attitude is further brought out in the following statement:

H. E. Hawk, in Oil Mill Superintendents' Association, June, 1913, says:

"As in our State we have a standard of 7.50 per cent., and the mill sells on that basis, we should be able to control the ammonia, within 10-100 per cent. of the 1 per cent. Otherwise the man that buys the meal or cake, if over 10-100 per cent. short will have a kick coming to him, and will be entitled to a reduction. On the other hand, if the mill sells meal for $7\frac{1}{2}$ per cent. ammonia, and it runs anywhere 7.60 per cent. to 7.75 per cent., the mill will be the loser of 30 cents for 7.60 per cent. up to 75 cents for 7.75 per cent. per ton of meal. This will be, as you can readily see, either a loss to the mill in getting its final settlements on meal sold if the ammonia runs too low, and, if on the other hand, the ammonia runs high it will be a great loss in running a higher value than it is sold for. In view of these facts, it is best to have the analysis often and to get a basis of standard in operation, then run to the standard constantly. This is accomplished by seeing that the linting is uniform, the hullers are kept sharp so that the hulling will be constantly uniform. That is, they must do their work constantly the same, then the separation to get the proper proportion of hull meal and this latter must be fine and free of lint, with the proper percentage to obtain, say, in amount of cake that will run the per cent. of ammonia just where you want it (and this, I say, can be done very easily if the equipment is right), then to take your samples of cooked meal, watch very closely the time, the temperature, in the progress of your cooking, get the smell, the feel, and the color the exact shade."

The Picard-Law Company, in The Oil Miller, December, 1914, states:

"Georgia shows an average of 7.16 per cent. ammonia in spite of the fact that a large percentage of the mills are shipping 7 per cent. cake. As near as we can figure it, the meal from this State has averaged 0.20 per cent. in ammonia above guarantee. At \$2.50 per unit this is 50 cents per ton excess value. Basing the meal sold during this time at 50,000 tons, the Georgia mills have given away \$25,000.00 worth of protein in an effort to keep their product up to the standard."

The Picard-Law Company, in The Oil Miller, February, 1914, states:

"The time is coming and coming fast when the mill that does not have daily analyses made of meal cannot keep up with the procession. It is the only way to regulate ammonia. It would surprise many mill managers to know that we can pick out nearly any day in the season

and show that the seed handled in our laboratory that day would produce meal varying as much as 1 per cent. in ammonia when exactly the same number of pounds are made per ton. This might happen in your mill any time that you change from one car to another.

"This may sound like taking advantage of our opportunity to pull for business, but if you will consider the matter carefully you will be convinced that you and not the chemist will be the big gainer. By regulating ammonia within ten points a two-press mill can often save enough in a couple of weeks to pay for analytical work the whole season. That the big companies realize this is proven by the fact that over thirty independent mills in Georgia, besides the corporation mills, have their products analyzed each day that they operate."

D. C. Picard, Alabama Cottonseed Crushers, in *The Oil Miller*, September, 1915, states:

"Most of you think, I am sure, that the sum total of 'getting results' is good separation and a low standard of press work, but to my mind one of the most important factors of all in making profits is close control of the ammonia. Of course, with seed of variable ammonia content, it is rather difficult to keep the ammonia constant by regulation at the second huller. Of late, a third huller has been installed in some mills for the sole purpose of controlling ammonia, which makes it somewhat easier; but, even with this, daily analyses of the cake is necessary.

"I wonder how many realize how large a loss this is; sometimes it is greater than allowing excess of oil to remain in the cake. One ton of $7\frac{1}{2}$ per cent. meal contains 150 pounds of ammonia, which is worth (since the value of the meal is in its ammonia), when meal is selling for \$28.00 per ton, very close to 20 cents per pound. If the meal is sold on this guarantee, but actual delivery runs 7.75 per cent., five extra pounds of ammonia are thrown in with each ton, making the customer a present of \$1.00 per ton. This is very nice for the customer, but downs the mill's profits quite a lot. It does not hit the bank-balance directly, like reclamations, but, nevertheless, when the books are closed several thousands of dollars are usually debited to excess values. Much of this can be prevented by the daily analyses above mentioned so that when shipments are made high and low ammonia meal can be mixed to make a close average. This has been done: it is entirely practical. Of course, if meal could always be sold, as it should be, on its ammonia, this would not be necessary, but we must meet conditions as we have them.

"To show you how excess ammonia figures in comparison with excess oil: The average oil mill tries to keep oil in the cake down to 6 per cent., or 120 pounds to the ton. If the oil runs 7 per cent., this will be 140 pounds. The extra 20 pounds of oil at $5\frac{1}{2}$ cents per pound is worth \$1.10 per ton, so you see the giving away of one-quarter of a per cent. of excess ammonia is practically equivalent to allowing 1 per cent. excess oil remain in the cake.

"Some of you may say: 'We cannot control our ammonia.' But,

yes you can! If you will use your chemists properly you soon get 'results.'"

The manufacturer of cottonseed oil has sometimes to contend with seed low in protein (or ammonia), or delinted so closely that separation is difficult, and has trouble in producing meal of the standard, if it is not too low. Sometimes separation of kernels from seed must, to some extent, be sacrificed, to produce the grade of meal desired.

While the manufacturer may be willing to sacrifice separation to come up to his guarantee in protein, when necessary to do so, he is not willing to sacrifice it to come up to a guarantee in crude fiber when it is not necessary to come up to his guarantee in protein. Protein, or protein and fat, is undoubtedly the most valuable constituent of cottonseed meal, and the manufacturer feels that when he suffers the burden of low protein seed, he should receive the recompense of high protein seed when it comes his way.

CRUDE FIBER STANDARD.

The definition of cottonseed meal adopted by the Feed Control Officials of the United States is as follows:

"Cottonseed meal is a product of the cotton seed only, composed principally of the kernel with such portion of the hull as is necessary in the manufacture of the oil; provided, that nothing shall be recognized as cottonseed meal that does not conform to the foregoing definition and that does not contain at least 36 per cent of protein."

We will inquire how much crude fiber represents "such portion of the hull as is necessary to the manufacture of the oil." This point is difficult to decide on the basis of analytical results alone.

The analyses given in Tables Nos. 3, 5, 6 and 7 show the average crude fiber content. Standards, however, must be above rather than below the maximum.

In the case of cottonseed meal, samples with low crude fiber may have had it reduced for the purpose of raising the protein. On the other hand, those with high crude fiber may have had it added, during the process of manufacture or otherwise, for the purpose of reducing the protein.

Then, also, there are certain varieties of cotton of which the seed are partly bare, like Sea Island seed. The hulls do not felt together, and are not easily removed.

Some millers also claim that a rather large amount of hulls is necessary to give drainage and reduce the oil; while other millers say that only a much smaller quantity is needed. This has been already discussed. Apparently a better extraction of oil is often accompanied by a higher percentage of hulls.

TABLE 20.—DISTRIBUTION OF FIBER CONTENTS OF COTTONSEED MEAL.

	Below 9.1	9.1 to 10.1	10.1 to 11.1	11.1 to 12.1	Over 12.1	Total
South Carolina M 1914.....	37	16	22	20	14	109
Georgia, 1915.....	25	10	5	2	1	43
Pennsylvania 265—1914.....	24	23	24	14	9	94
New York, 1911.....	14	8	2	2		26
New York, 1912.....	34	2				36
New York, 1913.....	24	8	2			34
New York, 1914.....	2	10	4	2		18
New York, 1915.....	11	11			1	23
New Jersey, 1913-14.....	7	6		1		14
New Jersey, 1914-15.....	14	4	1			20
Kentucky, 1914.....	22	26	13	11	9	80
Georgia, 1911-12.....	4	4				17
Georgia, 1912-13.....	14	4	2		11	31
Georgia, 1913-15.....	24	11	5	2	3	45
Louisiana, 1913-14.....	22	26	3	23	4	78

Table No. 20 shows the distribution of the fiber contents of cottonseed meals as analyzed in several States. Samples illegal in protein content were omitted. A large proportion of the samples contained 9 per cent. crude fiber, or less.

TABLE 21.—GUARANTEES OF CRUDE FIBER IN COTTONSEED MEAL.

	9 or less	9.1-10	10.1-11	11.1-12	Over 12.1
Kentucky, 1914 (185).....	4	17	1	1	1
New York, 1915 (404).....	1	9	4	5	2
Indiana, 1914 (177).....	5	24	3	10	5
South Carolina, 1915 (52).....	6	11	5	90	0
Louisiana (1913-14).....	22	21	6	26	4

Table No. 21 shows the guarantees of crude fiber made in five States. With the exception of South Carolina, the bulk of the guarantees is far less than 10.1 per cent. crude fiber.

TABLE 22.—AVERAGE FIBER CONTENT OF COTTONSEED MEALS (CALCULATED BY LAW).

	Pound per ton	Ammono- nia %	Fiber %	Pound per ton	Ammono- nia %	Fiber %
September—		1911			1912	
Total.....	943	7.25	11.10	888	7.12	7.60
October—		1911			1912	
Total.....	888	7.66	10.40	842	7.33	7.68
Georgia.....	865	7.73	9.88	833	7.30	9.22
North Carolina.....	904	7.75	9.78	853	7.35	8.70
South Carolina.....	950	7.37	12.32	830	7.55	8.19
Alabama.....	855	7.66	9.18	820	7.32	7.91
November—		1911			1912	
Total.....	880	7.71	10.23	838	7.62	8.59
Georgia.....	851	7.79	9.33	809	7.75	7.77
North Carolina.....	915	7.85	8.90	852	7.60	7.53
South Carolina.....	920	7.45	11.46	859	7.43	9.05
Alabama.....	883	7.48	10.84	837	7.56	10.04
December—		1911			1912	
Total.....	884	7.78	10.39	884	7.50	10.95
Georgia.....	865	7.84	9.96	882	7.46	11.15
North Carolina.....	910	7.93	10.13	859	7.70	11.06
South Carolina.....	950	7.42	10.50	933	7.46	11.34
Alabama.....	865	7.77	9.93	859	7.50	10.80

TABLE 22.—AVERAGE FIBER CONTENT OF COTTONSEED MEALS (CALCULATED BY LAW).

	Pound per ton	Ammo- nia %	Fiber %	Pound per ton	Ammo- nia %	Fiber %
January—		1912			1913	
Total.....	885	7.81	9.82	900	7.44	11.44
Georgia.....	851	7.88	8.58	900	7.40	11.86
North Carolina.....	927	7.75	10.67	893	7.66	10.73
South Carolina.....	938	7.59	11.54	876	7.33	9.94
Alabama.....	860	7.84	9.20	890	7.38	11.92
February—		1912			1913	
Total.....	887	7.78	10.21	887	7.48	10.77
Georgia.....	850	7.87	9.27	873	7.44	10.70
North Carolina.....	903	7.85	10.66	888	7.63	9.88
South Carolina.....	904	7.62	10.98	883	7.42	10.57
Alabama.....	860	7.82	9.68	885	7.58	11.20
March—		1912			1913	
Total.....	878	7.79	10.36	886	7.51	10.72
Georgia.....	853	7.84	9.82	858	7.53	11.26
North Carolina.....	902	7.92	9.66	911	7.57	10.46
South Carolina.....	955	7.62	12.34	925	7.31	11.50
Alabama.....	860	7.75	9.72	858	7.59	9.13
Average.....	892	7.71	10.22	869	7.48	9.98
Highest in fiber.....	955	7.62	12.34	900	7.40	11.86
Lowest in fiber.....	851	7.88	8.58	852	7.60	7.53

Table No. 22 shows the estimated yield, the average protein, and the calculated crude fiber, averaged by months for several States of the Southeast as presented by Mr. Law in The Oil Miller, June, 1913. The crude fiber was calculated on the basis of 3 per cent. in the expressed kernels, and 50 per cent. in the hulls.

	Seed.	Meats.	Hulls.	21.14.	22.01.	19.69.	26.46.	6.53.	4.17.	59.
Southern Cotton Oil Co., Memphis, Tenn.	18234H	Seed.	33.69	36.99	2.02	16.47	26.46	6.53	5.35	41
	18235H	Cake.	3.07	0.47	45.13	40.81	16.47	3.00	2.52	
Perkins Oil Co., [†] Memphis, Tenn.	18236H	Seed.	39.53	6.82	12.09	26.78	26.78	6.00	6.78	
	18237H	Meats.	20.39	23.19	18.79	26.88	26.88	6.51	4.24	
	18238H	Hulls.	32.20	38.51	1.85	16.50	16.50	5.50	5.44	59.5
	18239H	Cake.	3.04	0.69	43.68	42.13	42.13	8.00	2.46	40.5
†Florida Manufacturing Co., Madison, Fla.	18214H	Seed.	40.96	7.33	9.59	29.10	29.10	6.00	7.02	
	18215H	Meats.	19.02	22.46	17.27	30.57	30.57	6.54	4.14	58.5
	18216H	Hulls.	29.98	38.04	1.97	19.24	19.24	5.50	5.27	41.5
	18217H	Cake.	3.56	0.50	38.84	46.55	46.55	8.00	4.87	
Marion Harper Cotton Oil Co., Atlanta, Ga.	18218H	Seed.	23.61	23.34	18.27	38.15	38.15	6.00	3.71	
	18219H	Meats.	19.74	38.90	1.79	18.19	18.19	5.50	4.45	59.5
	18220H	Hulls.	31.17	5.61	42.47	43.52	43.52	8.00	2.62	40.5
	18221H	Cake.	2.93	0.46	15.19	34.06	34.06	6.00	5.59	
Swift & Co., Atlanta, Ga.	18218H	Seed.	32.68	22.24	19.37	28.07	28.07	6.55	3.59	
	18219H	Meats.	2.92	38.00	1.83	17.68	17.68	5.50	4.31	58
	18220H	Hulls.	38.10	5.67	43.60	42.41	42.41	8.00	2.59	42
	18221H	Cake.	30.97	21.83	12.75	31.77	31.77	6.00	5.71	
	18222H	Seed.	33.91	37.30	1.75	27.33	27.33	6.55	3.74	58
	18223H	Meats.	36.78	6.70	44.20	16.94	16.94	5.50	4.60	42
	18224H	Hulls.	31.60	0.48	13.05	51.30	51.30	8.00	2.54	
Alabama Cotton Oil Co., Montgomery, Ala.	18222H	Seed.	35.98	21.74	18.93	28.13	28.13	6.54	3.32	58.5
	18223H	Meats.	35.19	36.91	1.83	16.74	16.74	5.50	4.94	41.5
	18224H	Hulls.	35.75	0.75	19.86	34.18	34.18	8.00	2.49	
	18225H	Cake.	31.50	6.25	18.86	28.85	28.85	6.54	3.76	
Newton County Cotton Oil Co., Covington, Ga.	18225H	Seed.	31.75	21.31	11.76	16.36	16.36	5.50	4.61	57.5
	18226H	Meats.	30.08	36.35	1.76	41.39	41.39	8.00	2.96	42.5
	18227H	Hulls.	38.64	7.73	46.92	31.73	31.73	6.00	5.92	
Lookout Refining Co., Chattanooga, Tenn.	18238H	Seed.	31.94	27.20	19.80	26.84	26.84	5.56	3.36	57.5
	18239H	Meats.	31.89	36.54	1.70	16.04	16.04	5.50	4.36	42.5
	18240H	Hulls.	30.08	7.16	41.49	41.52	41.52	8.00	2.70	
	18241H	Cake.	41.98	7.16	10.71	28.81	28.81	6.00	5.46	
Calhoun Oil and Fertilizer Co., Calhoun, Ga.	18242H	Seed.	21.25	21.45	19.50	27.81	27.81	5.58	4.25	57
	18243H	Meats.	34.87	37.15	1.91	16.32	16.32	8.00	2.42	43
	18244H	Hulls.	3.21	0.53	42.82	43.04	43.04	6.00	5.57	
Southern Cotton Oil Co., Charlotte, N. C.	18246H	Seed.	40.72	5.73	11.63	30.35	30.35	6.51	3.85	59.5
	18247H	Meats.	19.95	23.67	18.04	27.98	27.98	5.50	4.67	40.5
	18248H	Hulls.	31.53	39.40	1.77	17.13	17.13	8.00	2.64	
	18249H	Cake.	2.95	0.58	41.95	43.90	43.90	6.00	4.24	
De Soto Cotton Oil Co., Memphis, Tenn.	27401K	Seed.	22.11	6.55	12.15	30.33	30.33	5.56	4.47	57.5
	27402K	Meats.	35.66	20.66	20.20	26.00	26.00	8.00	5.54	42.5
	27403K	Hulls.	3.79	35.48	1.93	15.89	15.89	6.50	3.01	
	27404K	Cake.	42.88	0.61	44.92	39.67	39.67	8.00	6.67	

*Seed somewhat heated.

†This mill makes soft cakes which will probably run high in oil.

‡Sea Island Seed. Last of season with poor seed.

TABLE 23.—AVERAGE ANALYSIS OF COTTONSEED AND COTTONSEED CAKE.

Collected by G. E. Bidwell, U. S. Dept. Agr.; Kellogg, Pa.; Cathcart, N. J.; Smith, Mass. Analysis of Seed Computed from Analysis of Hulls and Meats.

Name and Address of Manufacturer.	No.	Protein	Fat	Crude Fiber	Nitrogen Free Extract	Water	Ash	Per Cent in Seed
*North Carolina Cotton Oil Co., Raleigh, N. C.	18201H	{Seed.....	23.10	19.43	27.51	6.55	3.92	58
		{Hulls.....	39.39	1.87	16.96	8.00	4.85	42
North Carolina Cotton Oil Co., Wilmington, N. C.	18202H	{Seed.....	0.60	43.69	42.07	6.00	2.65	
		{Hulls.....	7.33	10.79	30.78	6.55	6.27	
Swift & Co., Columbus, S. C.	18204H	{Seed.....	22.99	19.42	27.68	8.00	3.87	58
		{Hulls.....	31.35	39.14	1.76	5.00	4.83	42
Swift & Co., Columbus, S. C.	18205H	{Seed.....	0.68	43.80	41.86	6.00	2.54	
		{Hulls.....	36.14	13.34	31.96	6.51	6.04	
South Carolina Cotton Oil Co., Columbus, S. C.	18206H	{Seed.....	23.42	18.04	28.12	5.50	4.49	59.5
		{Hulls.....	38.99	1.78	17.18	6.00	2.40	40.5
South Carolina Cotton Oil Co., Columbus, S. C.	18207H	{Seed.....	0.54	41.93	44.20	6.00	5.59	
		{Hulls.....	34.43	15.47	32.66	6.54	3.65	
Southern Cotton Oil Co., Savannah, Ga.	18208H	{Seed.....	23.64	18.56	28.49	5.50	4.55	58.5
		{Hulls.....	40.00	1.84	17.47	8.00	2.38	41.5
Southern Cotton Oil Co., Savannah, Ga.	18209H	{Seed.....	0.59	42.12	44.03	6.00	5.90	
		{Hulls.....	34.70	13.96	32.94	6.56	3.61	
Empire Cotton Oil Co., Valdosa, Ga.	18210H	{Seed.....	22.55	20.01	27.42	5.50	4.57	57.5
		{Hulls.....	38.76	1.83	17.12	8.00	2.30	42.5
Peoples Cotton Oil Co., Selma, Ala.	18211H	{Seed.....	0.60	44.61	41.38	6.00	6.21	
		{Hulls.....	8.20	10.93	30.03	6.55	3.55	58
Selma Oil, Ice and Fertilizer Co., Selma, Ala.	18212H	{Seed.....	22.14	19.33	27.86	5.50	4.39	42
		{Hulls.....	37.78	1.78	17.19	8.00	2.37	
Alabama Cotton Oil Co., Selma, Ala.	18213H	{Seed.....	0.55	43.57	42.60	6.00	5.68	
		{Hulls.....	6.14	14.32	31.99	6.54	3.70	58.5
Refuge Cotton Oil Co., Vicksburg, Miss.	18224H	{Seed.....	23.23	18.25	28.07	5.50	4.57	41.5
		{Hulls.....	39.39	1.94	17.21	8.00	2.47	
Alabama Cotton Oil Co., Selma, Ala.	18227H	{Seed.....	0.46	41.26	44.98	6.00	5.81	
		{Hulls.....	6.21	13.69	29.11	6.58	3.85	57
Alabama Cotton Oil Co., Selma, Ala.	18228H	{Seed.....	21.31	19.89	27.47	5.50	4.86	43
		{Hulls.....	37.07	1.89	16.25	8.00	2.51	
Alabama Cotton Oil Co., Selma, Ala.	18229H	{Seed.....	0.41	43.74	42.38	6.00	6.04	
		{Hulls.....	5.95	14.03	29.47	6.54	3.81	58.5
Alabama Cotton Oil Co., Selma, Ala.	18230H	{Seed.....	21.20	19.47	27.52	5.50	4.64	41.5
		{Hulls.....	33.99	1.82	17.68	8.00	2.65	
Alabama Cotton Oil Co., Selma, Ala.	18231H	{Seed.....	0.43	44.37	41.38	6.00	5.43	
		{Hulls.....	6.24	16.39	29.03	6.50	4.42	60
Alabama Cotton Oil Co., Selma, Ala.	18232H	{Seed.....	20.86	19.83	25.03	5.00	2.64	40
		{Hulls.....	32.70	1.94	15.65	8.00	2.40	
Alabama Cotton Oil Co., Selma, Ala.	18233H	{Seed.....	0.56	40.56	38.96	6.00	7.44	
		{Hulls.....	9.27	10.28	28.34	6.00		

Southern Cotton Oil Co., Memphis, Tenn.....	Seed Hulls.....	21.14 36.99	19.69 16.47	22.01 36.99	6.59 8.00	4.17 2.52
Perkins Oil Co., Memphis, Tenn.....	Seed Hulls.....	39.53 20.39	45.13 12.09	6.82 23.19	8.00 6.51	2.52 4.24
Florida Manufacturing Co., Madison, Fla.....	Seed Hulls.....	32.20 40.96	18.79 9.59	38.51 7.33	5.50 8.00	5.44 7.02
Marion Harper Cotton Oil Co., Atlanta, Ga.....	Seed Hulls.....	19.02 28.98	17.27 20.25	22.46 38.04	8.54 8.00	4.14 2.55
Swift & Co., Atlanta, Ga.....	Seed Hulls.....	23.61 31.17	38.84 18.27	7.12 23.34	8.00 5.51	4.87 3.71
Southern Cotton Oil Co., Montgomery, Ala.....	Seed Hulls.....	33.55 32.68	42.47 19.37	5.61 38.00	8.00 5.50	2.62 4.60
Alabama Cotton Oil Co., Montgomery, Ala.....	Seed Hulls.....	35.15 34.38	40.96 18.07	6.25 36.61	8.00 6.54	2.65 3.92
Newton County Cotton Oil Co., Covington, Ga.....	Seed Hulls.....	35.59 38.08	19.91 9.92	36.35 0.49	5.50 8.00	4.61 2.65
Lookout Refining Co., Chattanooga, Tenn.....	Seed Hulls.....	38.64 35.89	44.49 16.01	7.73 36.54	6.56 5.50	3.78 4.36
Calhoun Oil and Fertilizer Co., Calhoun, Ga.....	Seed Hulls.....	41.98 34.87	28.95 16.32	0.44 37.15	8.00 6.58	2.49 3.46
Southern Cotton Oil Co., Charlotte, N. C.....	Seed Hulls.....	39.53 2.95	42.82 11.63	0.51 23.67	5.50 8.00	4.25 2.42
De Soto Cotton Oil Co., Memphis, Tenn.....	Seed Hulls.....	38.73 35.66	41.95 12.15	0.56 20.66	8.00 5.50	4.67 5.54
	Seed Hulls.....	42.88 8.89	8.22 27.34	0.61 8.89	8.00 6.00	3.01 6.67

***Seed somewhat heated.**

+This mill makes soft cakes which will probably run high in oil.

Sea Island Seed. Last of season with poor seed.

TABLE 23.—AVERAGE ANALYSIS OF COTTONSEED AND COTTONSEED CAKE—Continued.

Collected by G. E. Bidwell, 1913-14 Analysis: Flaps, Texas; Bidwell, U. S. Dept. Agr.; Kollogg, Pa.; Cathcart, N. J.; Smith, Mass. Analysis of Seed Computed from Analysis of Hulls and Meats.

Name and Address of Manufacturer.	No.	Protein	Fat	Crude Fiber	Nitrogen Free Extract	Water	Ash	Per Cent in Seed
Union Seed and Fertilizer Co., Memphis, Tenn.	27403K	Seed..... Meats..... Hulls.....	21.57 35.21 35.27	20.36 35.27 0.61	20.74 1.82 45.81	6.58 5.50 8.00	4.16 5.28 2.67	57 43
	27404K	Cake.....	42.86	7.90	39.42	6.00	6.74	
	27405K	Seed..... Meats..... Hulls.....	22.01 35.76 3.03	20.42 34.83 0.53	26.70 16.95 45.88	6.55 5.50 8.00	3.86 4.91 2.41	58 42 48
Southern Cotton Oil Co., Little Rock, Ark.	27406K	Cake.....	45.58	7.47	26.51	6.00	6.81	
	27407K	Seed..... Meats..... Hulls.....	22.24 35.43 3.27	20.96 35.10 0.62	27.18 19.05 1.98	6.53 5.50 8.00	4.04 5.08 2.53	59 41
	27408K	Cake.....	44.42	6.65	41.96	6.00	6.75	
Morrilton Cotton Oil Co., Morrilton, Ark.	27409K	Seed..... Meats..... Hulls.....	20.60 36.17 3.39	18.15 34.07 0.55	23.12 1.96 46.51	6.69 5.50 8.00	4.17 5.33 2.89	52.5 47.5
	27410K	Cake.....	39.36	5.99	36.66	6.00	6.48	
	27411K	Seed..... Meats..... Hulls.....	21.37 35.44 3.11	20.11 35.15 0.58	30.24 17.03 46.24	6.59 5.50 8.00	5.88 4.94 2.51	56.5 43.5
Oklahoma Cotton Oil Co., Oklahoma City, Okla.	27412K	Cake.....	43.50	7.24	39.56	6.00	6.65	
	27413K	Seed..... Meats..... Hulls.....	23.65 39.12 3.13	19.65 33.98 0.64	25.27 15.40 47.62	5.58 5.50 8.00	3.32 4.15 2.20	57 43
	27414K	Cake.....	45.08	7.07	38.41	6.00	5.09	
American Ice and Oil Co., Oklahoma City, Okla.	27415K	Seed..... Meats..... Hulls.....	23.85 37.74 3.02	21.08 34.82 0.47	25.35 15.90 39.54	6.50 5.50 8.00	3.52 4.36 2.26	60 40
	27416K	Cake.....	28.23	8.55	46.71	6.00	4.29	
	27417K	Seed..... Meats..... Hulls.....	23.85 38.37 2.96	20.47 34.38 0.45	30.65 26.07 15.97	6.00 6.53 5.50	3.31 4.04 2.27	59 41
Southwestern Cotton Oil Co., Oklahoma City, Okla.	27418K	Cake.....	39.71	6.77	45.70	8.00	5.25	
	27419K	Seed..... Meats..... Hulls.....	22.86 39.02 3.12	13.41 22.64 1.79	28.86 25.63 15.60	6.00 6.63 5.50	3.46 4.36 2.85	55 45
	27420K	Cake.....	44.04	0.57	48.13	8.00	4.36	
Elk City Cotton Oil Co., Elk City, Okla.	27421K	Seed..... Meats..... Hulls.....	25.72 37.74 3.10	21.09 35.09 0.53	27.40 26.57 15.94	6.51 5.50 8.00	3.39 4.03 2.45	59.5 40.5
	27422K	Cake.....	42.00	6.69	43.73 11.98	6.00	5.09	

Wheeler Cotton Oil Co., Shamrock, Texas.	27423K	Seed.....	24.05	21.02	18.35	26.05	5.50	2.47	60
		Meats.....	36.07	34.77	43.02	45.03	8.00	2.51	40
		Hulls.....	3.02	0.40	18.03	26.34	6.00	3.33	
Memphis Cotton Oil Co., Memphis, Texas.	27424K	Cake.....	46.95	6.38	18.88	26.34	6.53	3.56	59
		Seed.....	24.52	20.37	1.82	42.51	8.00	2.46	41
		Meats.....	39.08	34.17	7.19	24.65	6.50	3.59	
		Hulls.....	3.08	0.52	19.02	25.75	8.00	3.62	
Quannah Cotton Oil Co., Quannah, Texas.	27426K	Cake.....	48.91	7.66	19.02	15.47	6.50	4.42	60
		Seed.....	24.52	20.59	1.82	41.17	8.00	2.42	40
		Meats.....	38.78	34.01	44.83	26.11	6.00	3.65	
		Hulls.....	3.12	0.46	17.77	15.38	6.46	3.39	
Riverside Cotton Oil Co.,	27428K	Cake.....	45.75	21.81	17.77	26.26	6.50	3.39	61
		Seed.....	24.29	35.40	12.81	42.95	8.00	2.59	39
		Meats.....	37.76	0.57	42.79	26.34	6.00	3.35	
		Hulls.....	3.23	6.58	10.81	15.76	6.53	3.56	59
J. W. Allison, Dallas, Texas.	27430K	Cake.....	44.92	20.33	19.61	15.76	8.00	2.59	41
		Seed.....	23.76	34.16	1.82	40.37	6.00	3.81	
		Meats.....	38.16	0.43	43.21	26.34	6.50	3.37	
		Hulls.....	3.02	7.97	17.80	15.80	6.58	4.07	53
Alamo Cotton Oil Co., San Antonio, Texas.	27432K	Cake.....	49.27	17.80	22.39	39.81	8.00	2.52	47
		Seed.....	22.84	33.11	43.93	24.24	6.00	3.48	
		Meats.....	40.05	0.54	21.28	15.74	6.50	4.25	56
		Hulls.....	3.42	9.60	15.80	24.24	8.00	2.40	44
Russell Coleman Cotton Oil Co., San Antonio, Texas.	27434K	Cake.....	48.51	18.94	45.69	39.81	6.00	3.61	
		Seed.....	23.35	0.46	21.28	15.74	6.50	4.25	56
		Meats.....	39.16	33.45	45.69	24.24	8.00	2.40	44
		Hulls.....	3.53	9.60	15.80	24.24	6.00	3.61	
Merchants and Planters Cotton Oil Co., Houston, Texas.	27436K	Cake.....	49.58	19.04	21.28	15.80	6.50	4.47	56
		Seed.....	23.05	33.67	46.09	39.81	8.00	2.52	44
		Meats.....	38.67	0.52	10.72	25.26	6.00	3.65	
		Hulls.....	43.17	20.26	15.61	38.60	6.50	4.53	58
Magnolia Cotton Oil Co., Houston, Texas.	27438K	Cake.....	52.83	34.67	27.48	38.46	8.00	2.42	42
		Seed.....	23.63	8.75	6.39	25.22	6.00	3.87	
		Meats.....	43.00	26.86	19.52	14.66	6.53	3.79	59
		Hulls.....	3.46	35.00	45.06	40.42	8.00	2.48	41
Orleans Cotton Oil Mill, New Orleans, La.	27441K	Cake.....	38.37	19.58	18.37	30.50	6.00	3.89	
		Seed.....	33.40	23.39	18.37	27.44	6.50	4.82	60
		Meats.....	32.11	38.64	43.10	43.03	8.00	2.50	40
		Hulls.....	2.84	0.53	7.09	28.06	6.00	3.75	
Highland Park Mfg. Co., Rock Hill, S. C.	27442K	Cake.....	44.19	23.19	18.75	27.05	6.51	3.75	59
		Seed.....	20.75	38.59	2.00	16.34	5.50	4.62	5
		Meats.....	32.95	0.58	43.37	42.77	8.00	2.46	40
		Hulls.....	39.66	6.83	12.10	29.38	6.00	3.81	
Southern Cotton Oil Co., Charlotte, N. C.	27444K	Cake.....	30.14	23.11	20.71	27.43	6.58	3.81	57
		Seed.....	18.36	40.04	1.87	17.66	5.50	4.79	43
		Meats.....	30.14	0.67	45.68	40.40	8.00	2.50	
		Hulls.....	2.75	6.33	8.92	26.99	6.00	7.00	
Elizabeth City Cotton Oil Co., Elizabeth City, N. C.	27446K	Cake.....	41.89	23.20	19.25	26.99	6.51	4.10	59
		Seed.....	19.95	38.57	2.07	17.44	5.50	5.17	5
		Meats.....	31.25	0.61	44.49	41.02	8.00	2.51	40
		Hulls.....	3.37	9.17	23.46	32.00	6.00	4.83	
Arizona Egyptian Cotton Oil Co.,* Phoenix, Arizona.	27449K	Cake.....	24.54	9.17					

*Whole pressed cotton seed.

Table No. 23 contains average analyses of cotton seed, and cotton-seed cake, the samples being collected by G. E. Bidwell of the U. S. Department of Agriculture, for a committee of the Association of Feed Control Officials. The seed are those from which the corresponding cake was made. The analyses reported are the averages of those made in several laboratories. The cake does not represent that which could be made if all the hulls possible were eliminated, but represents that made by the mills at the time of the collection of the samples, some of it on contract for specified ammonia content.

WATER CONTENT OF TEXAS COTTONSEED MEAL.

Table No. 24 shows the distribution of the water content of Texas cottonseed meals as compiled from our analyses for three years. The total number tabulated is 1107. Of these, 10, or 0.9 per cent., contain less than 5 per cent. water, and the same number contain over 10 per cent. water. The group 7 to 8 per cent. water contains the largest number of samples. About two-thirds of the samples contain 6 to 8 per cent. water.

TABLE 24.—DISTRIBUTION OF WATER CONTENT OF TEXAS COTTONSEED MEAL.

	Less than 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	Over 10	
July 1, 1915 to Dec. 31, 1915.....	2	17	73	96	55	12	2	
Jan. 1, 1915 to July 1, 1915.....	1	14	56	68	39	5	2	
Jan. 1, 1914 to July 1, 1914.....	0	6	16	46	47	13	2	
July 1, 1914 to Jan. 1, 1915.....	3	18	76	78	27	4	1	
July 1, 1913 to Jan. 1, 1914.....	2	7	38	57	28	7	1	
Jan., 1913 to July, 1913.....	2	11	69	73	23	8	2	
Totals.....	10	73	328	418	219	49	10	1107
Per cent.....	0.9	6.6	29.6	37.8	19.8	4.4	0.9	

ESTIMATION OF HULLS IN COTTONSEED MEAL.

A method for the estimation of hulls in cottonseed meal may be based upon the use of a solvent which has little effect upon cottonseed hulls, but has a great effect upon cottonseed meal. A method based upon this principle was described in Bulletin No. 109 of the Texas Experiment Station.

Since the hulls are rich in crude fiber, while the meal contains only a small percentage, the quantity of hulls may also be calculated approximately from the quantity of fiber present in the meal. A method based on this fact was described by the writer in Bulletin No. 166, May, 1914, of the Texas Experiment Station. In the calculations, 5 per cent. crude fiber was assumed to be present in the pure kernel residue, and 45 per cent. crude fiber in the hulls. The figure used for the fiber in the kernel residue is too high.

A method has been published by P. S. Tilson in a paper read before the National Oil Mill Superintendents' Association, July, 1915. This method is based upon the crude fiber, the calculations being made upon the basis of water and oil-free substance in meal, meats, and in hulls. The figures used are the average of his analyses of sixteen sam-

ples of cottonseed hulls and sixteen samples of cottonseed meal prepared from reginned cotton seed, as used by the cottonseed oil mills in the manufacture of cottonseed meal. His maximum, minimum, and average percentages of crude fiber contained in the oil and water-free meats and hulls are shown in Table No. 25, the average (corrected) for crude fiber in oil and water-free hulls being 54.61 per cent.

TABLE 25.—PERCENTAGE OF CRUDE FIBER IN OIL AND WATER FREE MEAL AND HULL.

	Hull	Meal
Maximum.....	59.33	2.69
Minimum.....	51.97	2.23
Average.....	54.61	2.46

The method is described as follows:

"Determine the moisture, oil, and crude fiber contents of the cottonseed cake or meal sample by the usual methods. Next calculate the factors 54.39 and 2.46 to the basis of the moisture and oil contents of the sample analyzed. Then by algebraic equations the total amount of hulls in the sample of cottonseed cake or meal is obtained.

"Suppose the cottonseed cake or meal analyzed as follows:

Moisture	8.93%
Oil	7.09%
Crude Fiber	9.00%

$$100 - (8.93 + 7.09) = 83.98\%.$$

$$54.39 \times 83.98 = 45.68\%.$$

$$2.46 \times 83.98 = 2.07\%.$$

Let X = amount of hulls in sample.

Let Y = amount of hull-free meal in sample.

$$\text{Then } X + Y = 100.$$

$$45.68X + 2.07Y = 9.0 \times 100.$$

$$45.68X + 2.07Y = 900.$$

$$2.07X + 2.07Y = 207.$$

$$43.61X = 693.$$

$$X = 15.89\%. \text{ Total hulls in sample.}$$

"NOTE.—Since this method is based on the crude fiber content of pure cottonseed hulls and hull-free meal obtained from the average reginned seed, it is evident that the method would not be as correctly applicable to cottonseed cake and meal made from cottonseed which have not been previously reginned."

This method may be reduced to the following formula:

X = Percentage of hulls in meal or cake.

W = Percentage of water in meal.

O = Percentage of oil in meal.

F = Percentage of crude fiber in meal.

$$X = \frac{100F - 2.46(100 - W - O)}{.5439(100 - W - O) - .0246(100 - W - O)}$$

$$X = \frac{100F - 2.46(100 - W - O)}{.5193(100 - W - O)}.$$

The hulls secured by this method of calculation would contain the same percentage of oil as the meal. The excess of oil over that naturally in the hulls really belongs to the meal; so that the calculated results are to this extent too high. If the hulls are assumed to contain 0.7 per cent. ether extract (oil), the calculated percentage of hulls is too high by $W-0.7$ per cent. of the amount of hulls present.

Cottonseed hulls may be regarded as being composed of two things, namely, *lint*, which is the cotton fiber on the outer portion of the hull, and *hull-bran*, which is the name given to the hard woody portion of the hull by manufacturers of cottonseed oil. Some analyses of these constituents of the hull are shown in Tables Nos. 26 and 27. It will be noted that the lint is very high in crude fiber, averaging nearly 84 per cent. The hull-bran or husk contains a much smaller quantity of crude fiber, averaging 41.3 per cent. This hull-bran was prepared by delinting with acid, though one analysis of hull prepared mechanically is also given.

TABLE 26.—COMPOSITION OF DELINTED HULL.

Lab. No.		Protein	Fat	Crude Fiber	Nitrogen Free Extract	Water	Ash
10499	Delinted by acid.....	4.86	.85	41.46	41.23	9.05	2.55
10500	Delinted by acid.....	4.19	.48	40.32	43.03	9.68	2.30
10501	Delinted by acid.....	4.81	.57	42.29	40.76	9.03	2.54
10502	Delinted by acid.....	4.06	.38	41.18	38.72	13.23	2.43
10503	Delinted by acid.....	4.89	.60	41.33	41.60	9.05	2.53
10504	Delinted by acid.....	4.31	.53	41.07	43.07	8.50	2.52
	Average.....	4.52	.57	41.28	41.40	9.76	2.48
7988	Bare hulls (fiber pulled off)...	3.33	.19	38.36	43.80	11.37	2.95

TABLE 27.—PERCENTAGE COMPOSITION OF MIDDLING COTTON.

Lab. No.		Protein	Ether Extract	Crude Fiber	Nitrogen Free Extract	Water	Ash
11111	.....	1.63	0.46	83.66	6.40	6.53	1.32
11112	.....	1.69	0.49	85.32	5.12	6.18	1.20
11113	.....	1.29	0.57	83.66	7.51	5.41	1.56
11114	.....	1.54	0.43	83.51	7.81	5.25	1.46
11115	.....	1.50	0.34	84.01	6.88	5.75	1.52
11116	.....	1.63	0.36	83.47	7.81	5.21	1.52
	Average.....	1.55	0.44	83.94	6.92	5.72	1.43

The composition of cottonseed hulls will therefore depend upon the relative quantities of lint and hull-bran present. The manufacturer keeps down the quantity of lint going into the meal as much as possible, and tries to regulate the composition of the meal with the hull-bran. This being the case, the cottonseed hulls that go into the cottonseed meal should contain a smaller proportion of lint and thus a smaller percentage of crude fiber than the hulls cut from the seed by hand. The cottonseed hulls manufactured likewise carry a larger proportion of lint and consequently a higher percentage of crude fiber than the hulls cut from the reginned seed by hand.

TABLE 28—COMPOSITION OF COTTONSEED HULLS.

Laboratory Number		Protein	Ether Extract	Crude Fiber	Nitrogen Free Extract	Water	Ash
6013	Animal Husbandary Dept. College.	5.07	1.68	46.05	.....	10.97	2.50
6979	Central Texas Cotton Oil Co., Temple, 6729	5.31	1.95	50.22	.....	6.66	4.34
6980	Central Texas Cotton Oil Co., Temple, 6730	4.08	.97	52.72	.....	7.07	2.50
6981	Farmers Gin and Milling Co., 6761	4.21	.78	53.60	.....	6.87	2.48
6982	Brazos Valley care Co., Waco, 6762	4.57	1.07	53.07	.....	6.88	2.81
6983	Lagrange Cotton Oil Co.	6.12	.99	53.00	.....	7.13	2.96
7701	Prof. J. C. Burns.	4.71	1.26	47.03	37.28	7.19	2.53
7982	Feeding and Breeding Station.	3.89	1.16	46.35	35.89	10.36	2.35
8031	Agronomy Department.	3.66	.50	51.52	.....	10.52	.....
8033	Agronomy Department, see 8032.	4.13	.42	49.47	.....	11.24	.....
8035	Agronomy Department, see 8034.	3.83	.22	.....	.....	10.61	2.95
8039	Agronomy Department, see 8038.	4.15	1.50	47.26	32.93	11.15	3.01
8041	Agronomy Department, see 8040.	3.62	.42	43.15	38.36	11.63	2.22
8043	Agronomy Department, see 8042.	3.21	.....	52.54	.....	10.80	2.38
8045	Agronomy Department, see 8044.	3.79	.14	50.39	52.41	10.83	2.44
8049	Agronomy Department, see 8048.	4.05	.26	.....	.....	.....	3.53
8051	Agronomy Department, see 8050.	3.35	.46	54.61	27.61	9.94	3.71
8053	Agronomy Department, see 8052.	4.69	.61	51.84	28.46	10.71	3.69
8055	Agronomy Department, see 8054.	3.41	.43	53.18	29.11	11.23	2.64
8057	Agronomy Department, see 8056.	3.26	.30	49.69	32.55	11.38	2.82
8059	Agronomy Department, see 8058.	4.16	.49	43.42	37.62	11.26	3.05
8061	Agronomy Department, see 8060.	3.64	.55	48.04	33.53	10.87	3.37
8063	Agronomy Department, see 8062.	3.51	.32	53.50	28.99	10.80	2.88
8065	Agronomy Department, see 8064.	3.52	.32	49.78	31.49	12.36	2.53
8067	Agronomy Department, see 8066.	6.58	1.03	36.16	42.19	10.48	3.56
8069	Agronomy Department, see 8068.	3.59	.32	45.49	34.96	12.31	3.33
8071	Agronomy Department, see 8070.	3.25	.24	54.41	29.05	10.76	2.29
8073	Agronomy Department, see 8072.	3.55	.50	44.86	35.94	12.39	2.76
8075	Agronomy Department, see 8074.	4.15	.62	49.22	32.06	11.16	2.79
8077	Agronomy Department, see 8076.	4.05	.60	49.02	32.50	10.15	3.68
8079	Agronomy Department, see 8078.	6.31	1.34	50.04	30.27	9.10	2.94
8081	Agronomy Department, see 8080.	3.96	.79	52.06	29.44	11.22	2.53
8082	Agronomy Department, see 8082.	3.62	.58	52.48	30.32	10.39	2.61
8085	Agronomy Department, see 8084.	3.17	.36	51.58	31.69	10.59	2.61
8087	Agronomy Department, see 8086.	3.21	.32	49.55	32.85	11.32	2.75
8089	Agronomy Department, see 8088.	3.70	.46	49.63	32.50	11.28	2.43
8091	Agronomy Department, see 8090.	4.17	.59	50.42	31.11	11.34	2.37
8093	Agronomy Department, see 8092.	3.41	.46	49.95	.....	.....	2.47
8095	Agronomy Department, see 8094.	3.21	.....	46.48	.....	.....	2.59
8097	Agronomy Department, see 8096.	3.89	.21	51.43	29.02	12.77	2.68
8099	Agronomy Department, see 8098.	3.62	.40	49.66	31.61	12.01	2.70
8101	Agronomy Department, see 8100.	3.46	.....	47.10	.....	.....	2.63
9534	Feeding Station, Coleman.	5.43	1.27	44.48	36.12	10.21	2.49
9583	Feeding and Breeding Station, see 9545.	4.29	1.12	45.82	35.40	10.34	3.03
9635	J. M. Jones, Coleman, Texas.	4.39	1.05	46.31	36.45	9.27	2.53
9726	9688 D. E. 65, Sample 1.	4.20	.57	51.82	32.69	7.88	2.84
9727	9689 D. E. 65, Sample 2.	3.96	.51	51.91	32.89	7.53	3.20
9948	Feeding and Breeding Station.	5.21	1.37	47.34	31.91	10.54	3.63
10990	Bryan Cotton Oil Co.	3.82	.45	44.39	38.36	10.60	2.38
	Average.	4.08	.69	49.20	32.93	10.26	2.84

Table No. 28 contains hull analyses. These hulls were mostly cut by hand from seed not reginned, and so contain an excess of lint, and thus an excess of fiber.

TABLE 29.—AVERAGE COMPOSITION OF COTTONSEED KERNEL AND HULL.

	Number Averaged	Protein	Fat	Crude Fiber	Nitrogen Free Extract	Water	Ash	Crude Fiber on water and Fat Free Basis	Crude Fiber on 4% water and Fat Basis	Per Cent Kernel in Seed
Texas seed, 1913, Kernels.....	66	38.26	33.00	2.12	15.09	7.13	4.40	3.54	3.04	.....
Texas seed, 1914, Kernels.....	59	38.71	33.43	2.19	14.85	6.43	4.39	3.64	3.13	.....
Various seed (Table 23) 1914-15, Kernels.....	46	34.99	36.51	1.87	16.47	5.50	4.66	2.75	2.36	.....
Average of Tilson Kernels.....	16	.....	.....	.....	.....	.....	.....	2.46	.....	.....
Texas and other seed (committee Table 23).....	14	38.54	34.24	1.81	15.65	5.50	4.26	.....	.....	58.0
Eastern seed (committee Table 23).....	32	33.38	37.50	1.87	16.92	5.50	4.83	.....	.....	58.1
Cottonseed Hulls, Texas, Bull 166.....	24	4.11	1.46	45.27	37.09	9.51	2.56	50.84	43.72	.....
Various seed, 1914-15 (Committee Table 23).....	46	3.12	0.54	43.69	42.15	8.00	2.50	47.78	41.03	.....
Various Hulls (Texas).....	47	4.08	0.69	49.20	32.93	10.26	2.84	55.10	47.39	.....
Hull average of Tilson.....	16	.....	.....	.....	.....	.....	.....	54.39	.....	.....
Assumed average.....	.....	3.5	0.7	45.00	39.2	9.0	2.6	.....	.....	.....

*Assumed.

Table No. 29 contains the average composition of a number of samples of hulls and kernels, and also the crude fiber content calculated to an oil-and-water-free basis. According to these figures, the average percentage of crude fiber in water- and oil-free cottonseed kernels would be about 3.5 per cent. For oil- and water-free cottonseed hulls, it would be about 49 per cent. These figures are somewhat different from those secured by Mr. Tilson. They represent, however, a larger number of samples and the analyses were made in different laboratories. The figures used by Tilson are too low for the crude fiber in the kernel residue and too high for the crude fiber in the hulls. These differences compensate for one another to some extent, but in general would cause the results to be too high for meals low in crude fiber, and too low for those high in crude fiber. If we substitute the above values, the formula would become:

$$X = \frac{100F - 3.5 (100 - W - O)}{.455 (100 - W - O)}$$

With 9 per cent. crude fiber, we would have 15.6 per cent. hulls. These figures are still not corrected for the extra oil content of the hulls.

By the use of the analyses in Table No. 23, we may calculate the percentage of hulls in the cake from the composition of the seed from which it was made, and compare the results with the results of methods based upon the crude fiber content of the meal. Of course, the method of calculating the hull content of the meal from the seed is not strictly accurate, and this fact must be borne in mind.

CALCULATION OF HULLS FROM COMPOSITION OF CAKE AND SEED.

The results of these calculations are contained in Table No. 30.

The quantity of meal of the composition found, that could be secured from the kernels of the composition given, was calculated by the formula:

$$X = 1000 \frac{A}{B}$$

Where X = pounds of the meal per 1000 pounds kernels.

A = percentage of protein in kernels.

B = percentage of protein in crude meal.

The quantity of pure meal that could be secured from kernels of the composition given was calculated by the formula:

$$Y = \frac{(100 - W - F) 1000}{100 - M - O}$$

Where Y = pounds of pure meal or kernel residue from 1000 pounds kernels.

W = water in kernels.

F = fat in kernels.

M = water in crude meal or cake.

O = fat in crude meal or cake.

In this formula, correction is made both for water and fat.

By subtracting the weight of the pure meal from the weight of the crude meal, we secure the weight of hulls. The weight of hulls divided by the weight of crude meal gives the percentage of hulls calculated from the composition of the seed. The results are in Table No. 29.

The percentage of hulls calculated by Tilson's formula are given in another column of the table. The results are usually low. This is to be expected, as the crude fiber content of the hulls used is high. On an average, the quantity of hulls found by the Tilson formula is 21.4, and that calculated from the composition of seed and meal is 23.2, a difference of 1.8 per cent. of the total, or nearly 9 per cent. of the hulls present.

TABLE 30.—QUANTITY OF PRODUCTS AND HULL CONTENT OF MEALS LISTED IN TABLE 23.

Laboratory Number	Crude Meal Pounds	Pure Meal Pounds	Hull Pounds	Per Cent Hulls	Factor	Hull by Tilson Formula	Hull by Modified Formula
18201	809	635	174	21.5	2.7	19.2	19.6
18204	867	632	235	27.1	2.6	24.6	25.8
18206	931	638	293	31.1	2.5	29.0	30.8
18208	883	622	261	29.5	2.7	25.9	27.1
18210	834	649	185	22.1	2.8	19.7	20.2
18212	930	645	285	30.0	2.6	26.2	28.1
18214	1260	649	611	48.0	2.6	40.0	43.5
18216	829	629	300	32.2	2.6	28.3	30.0
18218	857	639	218	25.4	2.6	23.0	24.6
18220	821	655	266	28.8	2.7	25.6	26.6
18222	978	659	319	32.6	3.0	25.6	27.0
18225	821	674	247	26.8	3.9	17.0	17.5
18224	801	627	174	21.7	3.0	25.3	26.5
18228	894	652	242	27.0	2.5	24.1	27.3
18230	930	662	268	28.8	2.2	31.2	33.3
18232	783	660	123	15.7	2.2	18.5	18.8
18234	852	697	155	18.1	2.1	21.9	22.7
18236	786	645	141	17.9	2.7	16.5	16.6
18238	854	667	187	21.8	2.8	19.0	19.4
18242	856	649	207	24.1	2.5	20.6	21.3
18246	814	630	184	22.6	2.5	22.0	22.8
27401	833	693	140	16.8	3.2	13.8	13.5
27403	821	688	133	16.1	2.5	16.4	16.4
27405	784	687	97	11.0	2.4	12.2	11.6
27407	797	680	117	14.6	2.4	14.9	14.8
27409	918	686	232	25.2	2.8	21.3	22.6
27411	814	684	130	15.9	2.5	16.1	16.1
27413	867	696	171	19.7	2.7	17.7	17.9
27415	1407	698	709	50.3	2.6	45.4	49.6
27417	966	689	277	28.6	2.8	24.8	26.0
27419	886	695	191	21.5	2.7	21.6	19.2
27421	898	680	218	24.2	2.6	25.6	22.4
27423	810	681	129	15.9	2.6	15.1	14.9
27425	799	698	101	12.6	2.0	11.0	10.6
27427	847	696	151	17.8	2.8	16.0	16.0
27429	840	676	164	19.5	2.5	19.0	19.4
27431	744	701	73	9.4	2.3	10.0	9.1
27433	829	712	73	8.8	2.3	8.9	8.8
27435	793	712	81	10.2	2.7	8.9	7.9
27437	880	695	185	21.0	2.0	18.9	19.3
27439	868	701	167	19.1	2.0	16.4	16.5
27441	1140	672	468	41.0	2.5	37.7	40.9
27443	726	648	78	10.7	2.6	11.1	10.3
27445	830	641	189	22.7	2.5	21.9	22.7
27447	719	621	98	12.2	2.1	14.8	14.6
27449	1310	659	651	49.6	2.4	46.3	53.0
Average				23.2	2.6	21.4	22.2

Table No. 30 contains the percentage of hulls calculated by the modified Tilson formula, based upon 3.5 per cent. crude fiber in the oil- and water-free kernels, and 49.0 per cent. crude fiber in the hulls. In 33 of the cases, the results given by this formula are closer to the results calculated from the seed than are the results by the original Tilson formula; in 9 cases, the Tilson formula is closer, and in 4 cases the results of the two formulas are the same. The average of the results by the modified formula is 22.2, which is closer to the results secured from the analysis of the seed than the Tilson formula.

FACTORS FOR CALCULATION.

Table No. 30 also contains factors calculated by the formula:

$$S = \frac{H}{F-3}$$

Where S = the factor.

F = the crude fiber content of the meal.

H = the hull content of the meal, calculated from the seed.

Reversing the formula, we may calculate the hulls from the crude fiber:

$$H = S(F-3)$$

The factors found vary from 2.0 to 3.9, with an average of 2.6. The factor 3.9 is entirely too high, the probable reason being that the seed and the meal are not really related.

The formula given above is derived from the following:

$$H = \frac{F-3}{C-3}$$

Where 3 = the crude fiber content of kernels on 14 per cent. water and fat basis.

C = fiber content of hulls on 14 per cent. water and fat basis.

$$S = \frac{1}{C-3}$$

Where S is the factor.

Then the crude fiber of the hulls on an approximate 14 per cent. water and fat basis would be

$$C = \frac{1}{S} + 3$$

The average crude fiber content of the hulls in these cottonseed

hulls would thus be $\frac{1}{2.6} + 3 = 38.4 + 3 = 41.4$ per cent. on the basis of the average water and fat content of these meals, which would be about 15 per cent. This is lower than the average crude fiber content of the hulls shown in Tables Nos. 28 and 29. As pointed out before,

the hulls in the meal or cake would contain less crude fiber than the commercial hulls, as they carry less lint.

Reference to Table No. 30 will show a decided variation in the factor. On account of the variation of the proportion of hull-bran to lint in different samples, the quantity of hulls calculated from the crude fiber present is more or less approximate, though sufficiently close for many purposes. For ordinary purposes, we suggest the use of the following formula for calculating the hulls from the crude fiber content:

$$H = (F-3) 2.46$$

Where H is the percentage of hulls, and F is the crude fiber content of the meal. When the fat and water combined vary far from 14 per cent., or when more careful calculations are desired, the formula given on page 49 should be used.

CALCULATING THE EXCESS OF HULLS IN TEXAS COTTONSEED MEAL AND HULLS.

Cottonseed meal sold in Texas must contain not less than 44 per cent. protein and not less than 51 per cent. protein and fat combined. A material containing less protein or less protein and fat contains an excess of hulls, and the quantity of excess hulls must be stated on the tag. The calculation of the excess hulls is based upon the protein, or protein and fat, and is the quantity of hulls that must be removed in order to bring the material up to standard quality.

If the material contains 7 per cent. or more of fat and less than 44 per cent. protein, then the excess hulls is the quantity that must be removed to bring the protein up to 44 per cent., allowing 3 per cent protein to be in the hulls.

$$.03H + .44 (100 - H) = P$$

The excess hulls may be calculated by subtracting the protein from 44 and dividing the result by 41.

$$H = \frac{44 - P}{41}, \text{ where } P = \text{the protein in the meal and hulls.}$$

$H = \text{the hulls.}$

If the material contains less than 7 per cent. fat, it must contain sufficient protein to make the total of protein and fat 51 per cent., in order to be termed cottonseed meal. The removal of hulls will, however, increase the fat in proportion to the quantity removed. If the calculations are made on the basis given above, the quantities of fat that will be raised to 7 per cent. fat are given in Table No. 31.

TABLE 31.—RELATION OF PROTEIN TO FAT AND HULL CONTENT OF TEXAS MEAL

Protein Per Cent	Corresponding Per Cent Hulls excess	Fat will be Raised to 7%
43.....	2.4	6.84
42.....	4.9	6.65
41.....	7.3	6.49
40.....	9.7	6.32
39.....	12.2	6.15
38.....	14.6	6.01
37.....	17.1	5.87
36.....	19.5	5.69

If the fat associated with the protein is equal or more than that in the table, the excess hulls is calculated by the formula:

$$H = \frac{44-P}{44}$$

If the fat associated with the protein is less than that given, then the excess hulls is calculated by the formula:

$$H = \frac{44+(R-F)-P}{44+(R-F)}$$

Where H is the excess of hulls.

R = the fat from Table No. 31 corresponding to the protein in the meal and hulls.

P = the protein in the meal and hulls.

F = the fat content of the meal and hulls.

COMPOSITION OF COTTON SEED.

The composition of the cotton seed affects the yield of oil, lint, meal, and hulls secured from it. The quantity of lint depends, to some extent, upon the method of ginning, although some varieties of seed retain much less lint than others. The important constituent of the seed is the oil; the more oil it contains, the more valuable it is to the miller. There is often greater competition between the mills in purchasing seed in localities whose seed is rich in oil than there is in localities producing poor seed; and the price paid for the better seed may be higher than that paid for poor seed. A difference of 1 per cent. oil represents 2.7 gallons of oil per ton, which at 40 cents per gallon would be \$1.08 per ton. Seed may, however, vary much more than 1 per cent. in oil content, as may be seen from the analyses given. This matter will be discussed further on a subsequent page.

CALCULATING THE YIELDS FROM THE ANALYSIS OF THE SEED.

Although, as stated elsewhere, there is a relation between the composition of the seed and the composition of the meal produced from it, yet on account of the standardization of cottonseed meal, the composition of the seed is usually looked at from the standpoint of the number of gallons of oil and the number of pounds of meal of a certain grade that can be produced from it. Thus, in Georgia, the miller who is trying to make meal containing $7\frac{1}{2}$ per cent. ammonia takes out a larger quantity of hulls when the seed is low in ammonia and permits a larger quantity of hulls to go in when the seed is high in ammonia. Thus, the composition of the seed regulates as nearly as possible the quantity of meal made. The quality of the product is regulated by the quantity of meal produced, the machinery being adjusted to produce the quantity desired, according to the character of the seed, and is controlled by a chemical analysis of the product and also of the seed. In the larger mills these analyses are made daily.

It has been stated that, if proper care is exercised in the laboratory,

the test of seed should represent at the outside within one gallon of what the yield of oil should be and within 50 pounds of the yield of meal.

A method used in calculating the results is given in the September, 1914, issue of The Oil Miller, by Mr. F. B. Porter, President of the Fort Worth Laboratories, as follows:

"In reporting analysis of seed, it is customary to report the results on the basis of clean seed with lint still on; i. e.—the per cent. of hulls also includes the linters. The following formulae have been derived, assuming that hulls as made in the mill contain .3 per cent. ammonia, and that hulls naturally contain .2 per cent. of gasoline soluble extractives. For the sake of those persons interested in following the derivation of the formulae, the original form of each formula is given. The original form is followed by the simplified form where necessary, which can be used by anyone knowing addition, multiplication, and subtraction:

a = per cent. of meats in seed.

b = per cent. of oil in meats.

c = per cent. of hulls in seed.

d = pounds of lint cut per ton of seed.

e = 1 minus average per cent. of oil in cake.

f = weight of hulls per ton of seed.

g = weight of cake per ton of seed.

h = per cent. of ammonia in seed.

i = weight of hulls in cake per ton of seed.

j = 1 minus average per cent. of oil in hulls as made.

k = per cent. of ammonia desired in cake.

l = weight of oil per ton of seed.

m = average per cent. of oil in cake.

n = average per cent. of oil in hulls as made, less 0.2 per cent.

$$I. \text{ Weight of cake per ton of seed} \dots g = \frac{2000h - (2000c - d) \cdot 0.03}{k}$$

$$\text{Simplified} \dots g = \frac{2000h - 6c + .003d}{k}$$

$$II. \text{ Weight of hulls in cake per ton of seed} \dots i = g - \frac{2000a - 2000ab}{e}$$

$$\text{Simplified} \dots i = ge - 2000a + 2000ab$$

$$\text{Weight of hulls per ton of seed} \dots f = \frac{2000c - i - d}{j + .002}$$

$$\text{Weight of oil per ton of seed} \dots l = 2000ab - mg - nf$$

$$g + d + f + l = 2000$$

In case the ammonia is given as a certain per cent. of the meats, instead of as a per cent. of the seed, the formula for g (weight of cake per ton of seed) becomes:

$$g = \frac{2000ap}{k}$$

where p is the per cent. of ammonia in meats.

"In the above calculations no account has been taken of the gain or loss in cooking. During a season like last season with excessive moisture in seed, there is undoubtedly a loss of weight during cooking. When the seed is dry and considerable water is added, there is probably a gain. This factor is not capable of exact expression, and is therefore thrown in with the so-called invisible losses of the mill.

"The invisible loss of a mill is made up of the loss in operation, loss due to dirt and motes, and loss or gain due to cooking. In order to obtain what weight of products the seed will actually give, taking into consideration the invisible loss, it is necessary to multiply the weights of products obtained in the above calculations by $(2000 - O - d)$ divided by $(2000 - d)$." O = average invisible loss.

The loss in moisture content could be allowed for by basing the calculations upon the oil- and moisture-free substance or by calculating the oil and moisture content by a method similar to that of Tilson, page 45, used in calculating the percentage of hulls in cottonseed meal from the crude fiber. A method of this kind is used on page 49.

The above method is not exactly followed by all commercial chemists, the difference being in the amount of ammonia and oil assumed to be in the hulls. The analysis of the seed for oil is based almost entirely upon the analysis of the kernels. The ammonia is sometimes determined in the kernels, but usually in the entire seed. In either case, an assumed value for the hulls is used in calculating the results.

The method of calculating the quantity of hulls described above is not exactly correct, since they are assumed to contain the same quantity of oil as the meal, whereas the hulls contain much less. This excess of oil really belongs with the kernel residue. Correction can be made by multiplying the weight of hulls by the per cent. of oil in the meal and by subtracting the result from the quantity of hulls found by the first calculation. There is also no allowance for the protein content of the hulls. With a protein content of 3 per cent., 200 pounds of hulls per 1000 pounds meal would represent 0.6 per cent. excess protein. On a basis of 40 per cent. protein, this would represent 15 pounds more meal per 1000 pounds. This quantity is within the limits of manufacturing possibility; so that the error is not great. The oil in the hulls, and the protein in the hulls are errors that balance one another as a rule in manufacturing.

EFFECT OF CONDITIONS ON COMPOSITION OF SEED.

A number of seed analyses are given by Garner, Allard, and Foubert in the *Journal of Agricultural Research*, 1914, page 228. According to the work reported by them, cited below, the oil content of cottonseed may be affected by the degree of maturity of the seed, the variety, and the soil and fertilizer used.

Mature and Immature Seed.—Table No. 32 shows the difference between the oil content of mature and immature seed selected in South Carolina. The average difference in favor of the mature seed is 2 per cent. oil, or 5.7 gallons per ton of seed.

TABLE 32.—OIL OF MATURE AND IMMATURE SEED, GARNER, ET AL.

	Per Cent Meats	Per Cent Oil in Seed
Immature Seed		
Toole.....	55.4	20.9
Trice.....	54.4	18.8
McCall.....	59.6	21.4
Average.....	56.5	20.4
Mature Seed		
Toole.....	61.2	23.3
Trice.....	57.6	20.9
McCall.....	60.7	22.9
Average.....	59.8	22.4

Soil and Fertilizer.—Table No. 33 shows the difference between the oil content as affected by soil and fertilizer. There is practically no difference in the oil content of kernels grown on two varieties of Georgia soil, though there is a small difference in the percentages of kernels.

TABLE 33.—SOIL AND FERTILIZER AFFECTING COTTONSEED. GARNER, ET AL.

	Per Cent Meats	Per Cent Oil in Meats	Per Cent Oil in Seed
Red Georgia Soil—1909	58.7	37.69	.....
1910.....	59.7	36.67	.....
1911.....	59.2	37.41	.....
Average.....	59.2	37.28	22.07
Gray Georgia Soil—1909	58.3	36.46	.....
1910.....	58.8	38.53	.....
1911.....	58.6	37.33	.....
Average.....	58.6	37.44	21.94
No Fertilizer	52.9	33.56	.....
.....	53.2	32.99	.....
.....	52.7	34.38	.....
.....	52.4	33.49	.....
Average.....	52.8	33.61	17.75
Complete Fertilizer—9-3-2	55.1	37.48	.....
9-6-2.....	55.0	33.85	.....
9-3-4.....	55.7	38.07	.....
9-6-4.....	56.1	36.40	.....
9-3-6.....	54.2	38.86	.....
9-6-6.....	56.0	36.78	.....
15-6-3.....	56.8	38.60	.....
15-3-4.....	55.3	37.48	.....
15-6-4.....	56.4	36.85	.....
Average.....	55.6	37.15	20.66

The fertilizer caused a decided increase in the oil content of the kernels, the average increase being 2.91 per cent. of the seed of 7.7 gallons of oil per ton of seed. The seed grown on the poor South Carolina soil is very low in oil for that locality.

TABLE 34.—VARIETY OF SEED—AVERAGE 1909-1910-1911. GARNER, ET AL.

	Per Cent Meats	Per Cent Oil in Meats	Per Cent Oil in Seed
Northern Georgia.			
King.....	59.5	36.54	.....
Runnell.....	57.5	37.40	.....
Shine.....	58.7	37.52	.....
Toole.....	60.3	37.33	.....
Dixie.....	59.4	38.06	.....
Hawkin.....	57.8	36.72	.....
Average.....	58.9	37.26	21.85
South Carolina Central Plain.			
King.....	58.2	39.14	.....
Runnell.....	55.7	40.73	.....
Shine.....	55.9	41.23	.....
Toole.....	57.9	40.87	.....
Dixie.....	57.3	42.07	.....
Hawkin.....	53.6	40.83	.....
Average.....	56.4	40.81	23.02

Locality.—Table No. 33 and also Table No. 34 show some effects of locality on the composition of the seed. The seed grown in Northern Georgia are poorer in oil than those grown in the South Carolina coastal plain, presumably with fertilizer, the difference being 1.17 per cent., or 34 gallons of oil per ton.

Varieties.—Table No. 34 shows some effect of varieties upon the composition of the seed, though the locality approximately has a greater effect. Table No. 35 from C. B. William's August, 1906, Bulletin of the North Carolina Board of Agriculture, shows great variations due to varieties. The seed were all grown on the Edgecombe North Carolina test farm.

TABLE 35.—COMPOSITION OF NORTH CAROLINA COTTONSEED (WILLIAMS, 1904).

	Per Cent Meat	Per Cent in Meat	Per Cent Nitrogen in Meat
Average of 25 varieties.....	57.40	39.66	4.86
Maximum in oil (Peterkin).....	56.73	42.02	4.64
Minimum in oil (Excelsior Ralifre).....	54.94	37.26	5.06
Maximum in Nitrogen (Toole).....	61.35	39.84	5.76
Minimum in Nitrogen (Hodge).....	56.10	41.90	4.37

EASTERN AND WESTERN SEED.

Seeds from the Eastern States contain more oil and less protein than those from the Western States. Table No. 36 contains average analyses as reported by several commercial chemists. A difference of nearly 3 per cent. oil, or 8 gallons per ton of seed, is shown between average seed analyzed in Atlanta and in Fort Worth or Houston. The figures given are the averages for the seasons indicated.

TABLE 36.—ANALYSIS OF SEED BY COMMERCIAL CHEMISTS.

	Moisture Per Cent	Oil, Per Cent	Available Oil Per Ton, Gal.	Total Oil Per Ton, Gal.	Ammonia Per Cent	Meats, Per Cent	Cake 7 1-2% Ammonia (lbs.)	Cake 45% Protein (lbs.)
Picard-Law, Atlanta, Ga., 1912-13	10.44	19.90	43.9	53.1	3.38	54.8	856	.....
Picard-Law, Atlanta, Ga., 1913-14	10.37	20.40	45.2	54.4	3.45	55.0	874	.....
Picard-Law, Atlanta, Ga., 1914-15	10.00	20.20	44.7	.....	3.49	.....	884	.....
Houston Laboratory, Houston, Tex. 1914-15	10.23	17.29	35.2	46.2	4.24	53.8	.....	.....
Houston Laboratory, Houston, Tex. 1915-16	9.08	18.04	38.1	.....	4.12	53.3	.....	894
Fort Worth Laboratory, Fort Worth, Tex., 1913-14	.....	16.71	.....	44.6	.....	53.9	.....	.....
Fort Worth Laboratory, Fort Worth, Tex., 1914-15	9.48	16.91	.....	45.1	4.24	55.8	.....	970
Fort Worth Laboratory, Fort Worth, Tex., 1915-16	10.05	18.12	.....	48.3	.....	54.2	.....	.....

COMPOSITION OF PURE KERNEL RESIDUE.

Table No. 45 shows the average composition of the pure kernel residue, free from hulls, that would be secured if the water and fat content should be reduced to 15 per cent.

On an average there is 5 per cent. difference in the protein content of the residue of Eastern and Western seed.

COMPOSITION OF TEXAS COTTON SEED.

A study of the composition of Texas cotton seed was made for two years, the samples used being from varieties grown in the various substations, and kindly furnished by Mr. H. Jobson, Assistant Agronomist. The objects of the study were to ascertain the relation of variety, and soil or season conditions to the composition of the seed, as well as to secure information as to Texas seed.

The seed were ginned in a hand gin. In some cases, this left more lint upon the seed than the ordinary ginning process. For this reason, in the second year of the experiment, we devised and used a method for lint on the seed, which is described on another page. The excess of lint would, of course, affect the relative proportion of hull to meats.

Table No. 37 shows the composition of the cottonseed kernels for the two years, arranged by localities.

TABLE 37.—COMPOSITION OF COTTONSEED KERNELS ARRANGED BY LOCATION.

Laboratory Number		Protein	Ether Extract	Crude Fiber	Nitrogen Free Extract	Water	Ash	Per Cent Kernels	Per Cent Lint
From College Station, 1913.									
8088	Unknown, L. S.	41.71	28.57			10.27		50.8	
8090	Lone Star	35.23	30.13	2.12		9.15		50.1	
8092	Mebane Triumph	40.04	29.09	1.69		9.09		53.4	
8094	Black Rattler	39.95	30.54			9.42		57.9	
8096	Hendricks	38.18	29.07			9.19		54.8	
8098	Bank Account	40.69	30.05	1.94		9.11		54.4	
8100	Cleveland Big Boll	42.34	28.85	2.32		8.77		53.2	
8102	Mortgage Lifter	42.36	28.98	2.15		6.52		51.4	
8104	Rowden	41.75	30.05	1.89		7.26		54.6	
8106	Half and Half	41.90	29.90			8.86		54.5	
Average		40.42	29.56	2.02		8.76		53.5	
From College Station, 1914.									
9316	Bank Account	41.16	31.24	2.18	14.65	6.38	4.39	51.2	10.4
9317	Half and Half	40.58	31.54			5.98		51.8	10.9
9318	Cleveland Big Boll	41.95	30.59			5.95		49.8	14.5
9319	Mortgage Lifter	43.44	29.21			6.16		50.0	13.7
9320	Lone Star	40.63	31.28			6.40		52.0	12.2
9321	Black Rattler	38.47	33.26			6.34		58.4	7.1
9322	Mebane	41.07	31.60			6.26		52.4	12.4
9323	Crowder	39.20	32.94			6.23		54.4	15.1
9324	Hendricks	39.97	32.36			5.97		54.4	
9325	Rowden	39.22	32.84	2.18	15.72	5.83	4.21	54.8	13.7
Average		40.56	31.68	2.18	15.13	6.15	4.30	52.92	12.2
From Lubbock, 1913.									
8145	Lone Star, No. 11	36.90	33.03			6.70		54.2	
8146	Crowder, No. 16	37.95	35.28	1.78		6.62		55.8	
8147	Mortgage Lifter, No. 152	36.16	35.93	1.96		5.66		54.5	
8148	Half and Half, No. 443	36.15	35.53	1.94		6.01		54.7	
8149	Bank Account, No. 130	36.34	35.57	2.47		5.46		56.2	
8150	Rowden, No. 77	35.61	35.51	1.73		5.55		55.6	
8151	Bank Account, No. 130	38.25	33.25	2.25		6.59		54.8	
8152	Black Rattler, No. 348	35.20	36.88	1.99		5.40		58.8	
8153	Mortgage Lifter, No. 152	38.95	33.17			6.98		53.7	
8154	Cleveland Big Boll, No. 485	38.26	33.83	2.31		6.64		52.6	
8155	Mebane Triumph, No. 128	38.20	34.22	1.95		6.41		55.4	
Average		37.00	34.75	2.04		6.18		55.1	
From Lubbock, 1914.									
9782	Bank Account	35.22	35.20			5.74		56.1	10.7
9783	Black Rattler	35.18	35.91			5.74		60.5	7.7
9784	Cleveland Big Boll	37.96	34.55			6.14		52.2	15.4
9785	Crowder	36.51	34.88			5.81		56.1	14.6
9786	Half and Half	36.56	33.75			5.57		56.1	10.7
9787	Hendricks	37.29	34.53			6.97		56.0	6.0
9788	Lone Star	37.01	33.75			6.47		54.0	12.7
9789	Mebane Triumph	37.17	34.23			6.55		54.5	12.1
9790	Mortgage Lifter	34.21	35.88			6.52		52.0	12.1
9791	Rowden	36.34	34.58			6.79		56.2	14.2
Average		36.34	34.72			6.22		5.53	11.6
From Pecos, 1913.									
8138	Cleveland Big Boll	32.59	38.03			5.85		53.2	
8139	Mebane Triumph	36.22	36.37					55.4	
8140	Lone Star	35.85	35.57			5.52		56.0	
8141	Black Rattler	33.57	38.58			5.49		61.2	
8142	Rowden	32.69	37.95	2.80		5.86		55.3	
8143	Crowder	32.64	39.01			5.66		55.3	
8144	Half and Half	34.87	36.03	2.13		5.95		55.9	
Average		34.06	37.36	2.47		5.72		56.0	

TABLE 37.—COMPOSITION OF COTTONSEED KERNELS ARRANGED BY LOCATION
—Continued.

Laboratory Number		Protein	Ether extract	Crude Fiber	Nitrogen Free Extract	Water	Ash	Per Cent Kernels	Per Cent Lint
From Pecos, 1914.									
9361	Rowden	33.54	36.49	2.25	17.15	5.66	4.91	53.4	18.6
9362	Hendricks	40.85	31.36	2.27	14.73	6.26	4.53	56.4	6.9
9363	Half and Half	36.31	34.02	4.15	14.88	5.84	4.80	53.8	10.5
9364	Crowder	39.92	33.38	2.29	14.50	5.62	4.49	53.6	13.2
9365	Lone Star	39.81	32.06	2.50	15.12	5.68	4.83	50.2	13.6
9366	Mebane	37.54	33.26	2.10	17.00	5.42	4.68	52.2	7.7
9367	Black Rattler	35.32	34.55	2.74	17.41	5.58	4.40	59.0	17.7
9368	Cleveland Big Boll	41.06	31.77	1.99	13.84	6.40	4.94	51.2	15.2
9369	Mortgage Lifter	35.06	35.61	2.03	16.10	6.22	4.98	50.8	15.2
9370	Bank Account	31.90	37.01	2.13	16.48	7.41	5.07	54.8	13.3
Average		37.13	34.00	2.44	15.69	5.98	4.76	53.5	11.8
From Beeville, 1914.									
9398	Bank Account	42.87	29.88	2.16	13.24	8.05	3.80	48.4	15.8
9399	Black Rattler	37.81	32.53	2.10	17.47	6.49	3.60	54.4	11.3
9400	Cleveland Big Boll	41.95	31.84	1.93	15.19	5.16	3.93	50.2	12.3
9401	Crowder	39.44	32.88	1.98	16.02	6.17	3.51	50.6	16.1
9402	Half and Half	38.42	31.78	2.15	17.48	6.46	3.71	52.0	16.6
9403	Hendricks	38.56	32.66	1.87	16.76	6.42	3.73	54.7	12.0
9404	Lone Star	41.21	30.94	1.85	15.61	6.80	3.59	49.5	15.2
9405	Mebane	39.51	33.23	2.05	15.28	6.41	3.52	51.0	13.3
9406	Mortgage Lifter	41.73	31.82	2.11	13.52	7.12	3.70	51.4	13.3
9407	Rowden	37.23	32.73	1.84	16.86	7.57	3.77	52.5	10.7
Average		39.87	32.02	2.00	15.77	6.66	3.68	51.4	13.7
From Nacogdoches Station, 1913.									
8050	Crowder, No. 16	34.72	36.44	2.04	.....	6.90	.....	52.5	.....
8052	Mebane Triumph, No. 12	37.01	34.53	1.94	.....	6.71	.....	53.0	.....
8054	Rowden, No. 77	35.22	37.06	1.92	.....	6.53	.....	53.5	.....
8056	Lone Star, No. 11	37.41	34.06	.....	.....	7.64	.....	55.0	.....
8058	Black Rattler, No. 348	34.97	36.49	2.10	.....	7.11	.....	55.0	.....
8060	Bank Account, No. 130	36.65	33.89	2.03	.....	7.63	.....	52.5	.....
8062	Cleveland Big Boll, No. 485	40.23	32.01	2.36	.....	7.79	.....	51.0	.....
8080	Half and Half, No. 443	35.97	34.75	1.97	.....	7.33	.....	53.5	.....
8082	Mortgage Lifter, No. 152	38.67	33.14	3.24	.....	7.60	.....	52.5	.....
Average		36.76	34.71	2.20	.....	7.25	.....	53.2	.....
From Nacogdoches, 1914.									
9443	348—Black Rattler	37.02	34.82	2.13	15.69	6.20	4.14	60.9	7.6
9444	130—Bank Account	36.63	35.05	1.86	16.15	6.06	4.25	54.9	12.5
9445	485—Cleveland	37.81	33.17	2.22	16.41	6.18	4.21	52.8	13.8
9446	16—Crowder	36.07	35.56	1.64	16.43	6.05	4.25	55.5	14.4
9447	443—Half and Half	39.53	33.55	2.30	14.38	5.99	4.25	56.9	10.8
9448	70—Hendricks	39.06	33.61	1.61	15.36	6.11	4.25	58.2	9.1
9449	11—Lone Star	39.95	33.95	1.82	14.58	5.37	4.33	54.4	12.9
9450	128—Mebane	37.73	34.10	1.30	17.14	5.55	4.18	54.6	12.8
9451	152—Mortgage Lifter	38.08	34.04	2.20	14.61	6.60	4.47	55.8	16.0
9452	77—Rowden	36.90	34.35	1.74	16.05	6.37	4.59	55.0	17.1
Average		37.87	34.22	1.88	15.70	6.04	4.29	55.9	12.7
From Spur, 1914.									
9453	130—Bank Account	39.06	35.09	2.02	13.83	5.58	4.42	57.4	9.3
9454	3534—Black Rattler	37.44	35.59	1.71	15.68	5.36	4.22	59.7	8.6
9455	485—B. B. Cleveland	39.64	33.05	2.02	13.34	7.63	4.32	50.3	14.9
9456	16—Crowder	38.09	34.66	1.97	14.69	6.24	4.35	55.7	14.9
9457	443—Half and Half	37.63	34.55	2.02	14.69	6.71	4.40	52.0	11.6
9458	79—Hendricks	38.28	32.86	2.61	14.74	7.15	4.36	58.6	7.1
9459	11—Lone Star	38.25	32.51	2.10	17.85	5.00	4.26	53.2	11.3
9460	128—Mebane	38.35	33.35	2.71	13.41	8.01	4.17	55.4	10.8
9461	152—Mortgage Lifter	38.48	33.18	2.87	13.45	7.64	4.38	54.8	11.9
9462	77—Rowden	36.80	34.03	2.45	14.64	7.50	4.58	55.7	14.4
Average		38.20	33.89	2.24	14.64	6.69	4.34	55.3	11.4

TABLE 37.—COMPOSITION OF COTTONSEED KERNELS ARRANGED BY LOCATION
—Continued.

Laboratory Number		Protein	Ether Extract	Crude Fiber	Nitrogen Free Extract	Water	Ash	Per Cent Kernels	Per Cent Lint
From Angleton, 1914.									
9463	Bank Account	40.58	33.77	2.23	12.01	7.03	4.38	53.9	12.4
9464	Black Rattler	39.00	34.36	2.46	12.75	7.32	4.11	57.5	9.8
9465	Cleveland B. B.	41.88	32.13	2.45	10.58	8.39	4.57	50.0	15.8
9466	Crowder	41.35	32.93	2.40	11.39	7.60	4.33	53.5	13.8
9467	Half and Half	39.83	33.72	2.56	12.32	7.13	4.44	54.5	12.8
9468	Hendricks	40.00	33.66	2.45	13.88	5.61	4.40	55.6	10.0
9469	Lone Star	41.48	32.69	2.21	12.49	6.83	4.30	53.6	10.8
9470	Mortgage Lifter	39.63	33.33	2.38	13.02	7.18	4.46	51.6	10.7
9471	Rowden	41.38	32.60	2.09	11.78	7.78	4.37	52.4	14.0
Average		40.58	33.25	2.35	12.25	7.20	4.37	53.6	12.2
From Troup, 1913.									
8006	Cleveland Big Boll, No. 485.	41.30	29.69	2.47	.....	8.41	.....	49.4	.....
8032	Lone Star, No. 11	38.97	30.53	.....	.....	8.27	.....	49.3	.....
8034	Hendricks, No. 79	40.59	31.61	2.34	.....	8.40	.....	54.6	.....
8036	Mebane Triumph, No. 128	41.36	31.08	2.39	.....	8.54	.....	51.8	.....
8038	Half and Half, No. 443	41.20	30.94	1.95	.....	7.79	.....	54.0	.....
8040	Black Rattler, No. 348	38.25	32.26	2.28	.....	7.73	.....	56.8	.....
8042	Crowder, No. 16	38.56	31.14	1.98	.....	7.66	.....	55.0	.....
8044	Mortgage Lifter, No. 152	41.72	29.63	1.98	.....	7.78	.....	52.2	.....
8046	Rowden, No. 77	40.76	31.55	1.77	.....	7.62	.....	54.0	.....
8048	Bank Account, No. 150	40.41	31.61	2.23	.....	7.58	.....	55.0	.....
Average		40.31	31.00	2.15	.....	7.98	.....	53.2	.....
From Troup, 1914.									
9716	Bank Account	37.37	34.60	1.86	15.44	5.90	4.83	56.7	9.0
9717	Black Rattler	37.95	33.75	1.95	15.41	5.97	4.97	61.6	.....
9718	Cleveland Big Boll	37.84	33.44	2.09	16.12	5.33	5.18	52.7	13.7
9719	Crowder	37.37	35.39	2.08	14.11	6.14	4.91	55.8	14.6
9720	Half and Half	35.98	33.42	3.10	16.97	5.86	4.67	56.0	10.9
9721	Hendricks	40.40	31.43	2.43	14.06	6.99	4.69	58.8	5.7
9722	Lone Star	39.50	33.00	2.23	14.45	6.08	4.74	55.9	9.8
9723	Mebane	39.57	32.06	2.45	14.41	6.70	4.81	55.2	10.9
9724	Mortgage Lifter	41.20	32.41	2.30	13.28	5.78	5.03	53.6	12.9
9725	Rowden	40.80	32.71	1.61	13.61	6.10	5.17	56.3	16.2
Average		38.79	33.23	2.21	14.78	6.09	4.90	56.2	11.5
From Denton Station, 1913.									
8064	Lone Star, No. 11	39.69	30.73	.....	.....	8.61	.....	53.5	.....
8066	Hendricks, No. 78	39.86	30.48	2.38	.....	8.63	.....	55.0	.....
8068	Bank Account, No. 130	40.06	32.39	1.96	.....	6.89	.....	54.8	.....
8070	Crowder, No. 16	39.61	32.75	1.87	.....	8.30	.....	54.7	.....
8072	Black Snake, No. 348	37.98	33.37	2.07	.....	8.53	.....	58.4	.....
8074	Half and Half, No. 443	40.16	31.87	2.22	.....	8.33	.....	54.6	.....
8076	Mortgage Lifter, No. 152	41.01	30.96	.....	.....	7.98	.....	52.5	.....
8078	Rowden, No. 77	35.84	32.50	.....	.....	8.77	.....	54.7	.....
8084	Mebane Triumph, No. 128	39.86	31.20	.....	.....	6.55	.....	53.4	.....
8086	Cleveland Big Boll, No. 485	40.42	30.63	2.32	.....	7.54	.....	51.9	.....
Average		39.45	31.69	2.14	.....	7.18	.....	54.4	.....
From Temple, 1913.									
8320	Millers Long Staple	39.87	32.29	.....	.....	6.46	.....	53.4	.....
8321	Hogins Long Staple	37.75	34.73	1.89	.....	6.22	.....	54.9	.....
8322	Cleveland Big Boll, No. 485	39.37	32.86	.....	.....	6.85	.....	51.5	.....
8323	Bank Account, No. 130	38.49	34.48	.....	.....	6.21	.....	54.0	.....
8324	L. S. No. 178	38.49	32.33	1.93	.....	5.75	.....	55.2	.....
8325	Black Rattler	37.33	33.94	.....	.....	6.13	.....	56.2	.....
8326	Crowder, No. 16	37.63	33.81	.....	.....	6.04	.....	53.6	.....
8327	Mortgage Lifter, No. 152	40.13	32.29	.....	.....	6.52	.....	53.3	.....
8328	Lone Star, No. 11	37.95	32.46	.....	.....	6.61	.....	52.0	.....
Average		38.56	33.24	1.91	.....	6.31	.....	53.8	.....

Table No. 38 shows the average composition of the cottonseed kernels, arranged by localities for the two years. From seven to ten varieties were taken from each locality, and as nearly as possible the same varieties were secured from each station, but this was not always possible.

TABLE 38.—AVERAGE COMPOSITION OF COTTONSEED KERNELS FROM VARIOUS LOCALITIES.

	No. Averaged.	Protein	Ether extract	Crude Fiber	Nitrogen Free Extract	Water	Ash	Per Cent Kernels	Per Cent Lint
College Station.....	10	40.42	29.56	2.02	15.13	8.76	4.30	53.5	12.2
College Station, 1914.....	10	40.56	31.68	2.18	15.13	6.15	4.30	52.9	12.2
Lubbock, 1913.....	11	37.00	34.75	2.04	15.13	6.18	4.30	55.1	11.6
Lubbock, 1914.....	10	36.34	34.72	2.47	15.13	6.22	4.30	55.4	11.6
Pecos, 1913.....	7	34.06	37.36	2.44	15.13	5.72	4.30	56.0	11.6
Pecos, 1914.....	10	37.13	34.00	2.00	15.69	5.98	4.76	53.5	11.8
Beeville, 1914.....	10	39.87	32.02	2.20	15.79	6.66	3.68	51.4	13.7
Nacogdoches, 1913.....	9	36.76	34.71	1.88	15.79	7.25	4.30	53.2	12.7
Nacogdoches, 1914.....	10	37.87	34.22	2.24	15.70	6.04	4.29	55.9	12.7
Spur, 1914.....	10	38.20	33.89	2.35	14.64	6.69	4.34	55.3	11.4
Angleton, 1914.....	10	40.58	33.25	2.15	12.25	7.20	4.37	53.6	12.2
Troup, 1913.....	10	40.31	31.00	2.21	14.78	7.98	4.30	53.2	11.6
Troup, 1914.....	10	38.79	33.23	2.14	14.78	6.09	4.90	56.2	11.6
Denton, 1913.....	10	39.45	31.69	2.14	14.78	7.18	4.30	54.4	11.6
Temple, 1913.....	9	38.56	33.24	1.91	14.78	6.31	4.30	53.8	11.6

The highest fat content is shown at Pecos, in the western part of the State, in 1913. The lowest is at College Station, in 1913. College Station, Beeville, Troup, and Denton show a smaller fat content; Nacogdoches, Lubbock, Pecos, Spur, Angleton, and Temple show a larger fat content. Nacogdoches is in the eastern part of the State; while Lubbock, Pecos, and Spur are in the western part. The differences here shown are thus not altogether due to climatic conditions, but are partly due to the soil.

TABLE 39.—AVERAGE COMPOSITION OF SEED AND YIELD BY LOCALITIES.

	Percentage		Meal Lbs. Per Ton	Oil Gallons Available Per Ton
	Protein	Fat		
College Station, 1913-14.....	21.54	15.97	979	33.3
Lubbock, 1913-14.....	20.28	19.21	922	42.5
Pecos, 1913-14.....	19.51	19.55	887	43.9
Beeville, 1913-14.....	20.49	16.46	932	35.2
Nacogdoches, 1913-14.....	20.38	18.82	926	41.5
Spur, 1914.....	21.12	18.74	960	41.1
Angleton, 1914.....	21.75	17.82	989	38.3
Troup, 1913-14.....	21.63	17.56	984	37.6
Denton, 1913.....	21.46	17.24	976	36.9
Temple, 1913.....	20.75	17.88	943	38.9

Table No. 39 shows the average composition of the seed and yields by localities, 7 to 10 varieties from each locality being grown two years. The yield of meal is based upon 44 per cent. protein, and the yield of oil upon 7 per cent. oil in the meal, with no manufacturing loss. The yields are seen to vary from 33.3 to 41.5 gallons oil per ton, and the

yield of meal from 887 to 989 pounds per ton. The lowest yield of oil is at College Station, and the highest at Pecos; where the cotton was grown under irrigation. The writer is inclined to believe that the differences are due largely to the soil, and to a less extent to seasonal conditions.

TABLE 40.—AVERAGE COMPOSITION OF COTTONSEED KERNELS OF VARIOUS VARIETIES.

	No. Average.	Protein	Ether Extract	Crude Fiber	Nitrogen Free Extract	Water	Ash	Per Cent Kernels	Per Cent Lint
Bank Account, 1913.....	7	38.56	33.05	2.15	.....	7.07	.....	54.5	.....
Bank Account, 1914.....	9	38.10	33.98	2.06	14.70	6.60	4.56	54.3	11.7
Black Rattler, 1913.....	7	36.75	34.58	2.11	.....	7.12	.....	57.8	.....
Black Rattler, 1914.....	8	37.27	34.35	2.18	15.79	6.17	4.24	59.1	8.5
Cleveland Big Boll, 1913.....	7	39.22	32.27	1.89	.....	6.33	.....	51.8	.....
Cleveland Big Boll, 1914.....	8	40.01	32.57	2.12	14.31	6.43	4.56	51.2	14.3
Crowder, 1913.....	6	36.85	34.74	1.92	.....	6.86	.....	54.5	.....
Crowder, 1914.....	8	38.49	34.08	2.06	14.69	6.28	4.37	54.4	14.6
Half and Half, 1913.....	6	38.38	33.17	2.04	.....	7.38	.....	54.5	.....
Half and Half, 1914.....	8	38.11	33.29	2.71	15.32	6.19	4.38	54.1	11.9
Hendrick, 1913.....	3	39.54	30.39	2.36	.....	8.74	.....	54.8	.....
Hendrick, 1914.....	8	39.30	32.81	2.21	14.92	6.43	4.33	56.6	7.1
Hogins Long Staple, 1913.....	1	37.75	34.73	1.89	.....	6.22	.....	54.9	.....
Lone Star, 1913.....	7	37.43	32.36	2.12	.....	7.50	.....	52.9	.....
Lone Star, 1914.....	8	39.73	32.52	2.12	15.21	6.08	4.34	52.9	12.4
Mebane Triumph, 1913.....	6	38.78	32.82	1.99	.....	7.46	.....	53.9	.....
Mebane Triumph, 1914.....	7	38.71	33.12	2.12	15.37	6.41	4.27	53.6	11.1
Mortgage Lifter, 1913.....	7	39.86	32.01	2.33	.....	7.01	.....	52.9	.....
Mortgage Lifter, 1914.....	8	38.98	33.19	2.32	14.26	6.70	4.55	52.5	13.2
Rowden, 1913.....	6	36.98	34.10	2.02	.....	6.93	.....	54.6	.....
Rowden, 1914.....	8	37.78	33.79	2.02	15.20	6.70	4.51	54.5	14.9

Table No. 40 shows the average composition of the cotton seed kernels, arranged by varieties.

TABLE 41.—AVERAGE COMPOSITION OF SEED AND YIELDS BY VARIETIES.

	Percentage		Meal Lbs. Per Ton	Oil Gallons Available Per Ton
	Protein	Fat		
Bank Account, 1913-14.....	20.85	18.24	948	39.8
Black Rattler, 1913-14.....	21.65	20.17	984	44.6
Cleveland Big Boll, 1913-14.....	20.40	16.70	928	35.6
Crowder, 1913-14.....	20.53	18.76	933	41.3
Half and Half, 1913-14.....	20.77	18.05	944	39.3
Hendricks, 1913-14.....	21.96	17.60	999	37.6
Hogins Long Staple, 1913.....	20.73	18.62	942	40.9
Lone Star, 1913-14.....	20.41	17.16	928	36.8
Mebane Triumph, 1913-14.....	20.85	18.01	948	39.2
Mortgage Lifter, 1913-14.....	20.77	17.18	944	37.0
Rowden, 1913-14.....	20.41	18.54	928	40.1

Table No. 41 shows the average composition of the seed by varieties, and yields of the different varieties. Table No. 42 shows the analyses of the individual seed, arranged by varieties. This is printed in full in order that the different varieties may be compared locality by locality, if desired.

TABLE 42.—COMPOSITION OF COTTONSEED KERNELS, ARRANGED BY VARIETIES.

Laboratory Number		Protein	Ether extract	Crude Fiber	Nitrogen Free Extract	Water	Ash	Per Cent Kernels	Per Cent Lint
	Bank Account, 1913								
8048	Troup	40.41	31.61	2.23		7.58		55.0	
8060	Nacogdoches	36.65	33.89	2.03		7.63		52.5	
8068	Denton	40.06	32.39	1.96		6.89		54.8	
8098	Main Station	40.69	30.05	1.94		9.11		54.4	
8149	Lubbock	35.34	35.57	2.47		5.46		56.2	
8151	Lubbock	38.25	33.35	2.25		6.59		54.8	
8323	Temple	38.49	34.48			6.21		54.0	
	Average	38.56	33.05	2.15		7.07		54.5	
	Bank Account, 1914.								
9316	Main Station	41.16	31.24	2.18	14.75	6.38	4.39	51.2	10.4
9782	Lubbock	35.22	35.20			5.74		56.1	10.7
9370	Pecos	31.90	37.01	2.13	16.48	7.41	5.07	54.8	13.3
9398	Beeville	42.87	29.88	2.16	13.24	8.05	3.80	48.8	15.8
9444	Nacogdoches	36.63	35.05	1.86	16.15	6.06	4.25	54.9	12.5
9453	Spur	39.06	35.09	2.02	13.83	5.58	4.42	57.4	9.3
9463	Angleton	40.58	33.77	2.23	12.01	7.03	4.38	53.9	12.4
9716	Troup	37.37	34.60	1.86	15.44	5.90	4.83	56.9	9.0
	Average	38.10	33.98	2.06	14.70	6.60	4.56	54.3	11.7
	Black Rattler, 1913.								
8040	Troup	38.25	32.26	2.28		7.73		56.8	
8058	Nacogdoches	34.97	36.49	2.10		7.11		55.0	
8072	Denton	39.98	33.37	2.07		8.53		58.4	
8094	Main Station	39.95	30.54			9.42		57.9	
8141	Pecos	33.57	38.58			5.49		61.2	
8152	Lubbock	35.20	36.88	1.99		5.40		58.8	
8325	Temple	37.33	33.94			6.13		56.2	
	Average	36.75	34.58	2.11		7.12		57.8	
	Black Rattler, 1914.								
9321	Main Station	38.47	33.26			6.34		58.4	7.1
9783	Lubbock	35.18	35.91			5.74		60.5	7.7
9367	Pecos	35.32	34.55	2.74	17.41	5.58	4.40	59.0	7
9399	Beeville	37.81	32.53	2.10	17.47	6.49	3.60	54.4	11.3
9443	Nacogdoches	37.02	34.82	2.13	15.69	6.20	4.14	60.9	7.6
9454	Spur	37.44	35.59	1.71	15.68	5.36	4.22	59.7	8.6
9464	Angleton	39.00	34.36	2.46	12.75	7.32	4.11	57.5	9.8
9717	Troup	37.95	33.75	1.95	15.41	5.97	4.97	61.6	
	Average	37.27	34.35	2.18	15.79	6.17	4.24	59.1	8.5
	Cleveland Big Boll, 1913.								
8006	Troup	41.30	29.69	2.47		8.41		49.4	
8062	Nacogdoches	40.23	32.01	2.36		7.79		51.0	
8086	Denton	40.42	30.63	2.32		7.54		51.9	
8100	Main Station	42.34	28.85	2.32		8.77		53.2	
8138	Pecos	32.59	38.03			5.85		53.2	
8154	Lubbock	38.26	33.83	2.31		6.64		52.6	
8322	Temple	39.37	32.86			6.85		51.5	
	Average	39.22	32.27	1.89		6.33		51.8	
	Cleveland Big Boll, 1914.								
9318	Main Station	41.95	30.59			5.95		49.8	14.5
9784	Lubbock	37.96	34.55			6.14		52.2	15.2
9368	Pecos	41.06	31.77	1.99	13.84	6.40	4.14	51.2	
9400	Beeville	41.95	31.84	1.93	15.19	5.16	3.93	50.2	12.3
9445	Nacogdoches	37.81	33.17	2.22	16.41	6.18	4.21	52.8	13.8
9455	Spur	39.64	33.05	2.02	13.34	7.63	4.32	50.5	14.9
9465	Angleton	41.88	32.13	2.45	10.58	8.39	4.57	50.0	15.8
9718	Troup	37.84	33.44	2.09	16.12	5.33	5.18	52.7	13.7
	Average	40.01	32.57	2.12	14.31	6.43	4.56	51.2	14.3

TABLE 42.—COMPOSITION OF COTTONSEED KERNELS, ARRANGED BY VARIETIES
—Continued.

Laboratory Number		Protein	Ether extract	Crude Fiber	Nitrogen Free Extract	Water	Ash	Per Cent Kernels	Per Cent Lint
	Crowder, 1913.								
8042	Troup	38.56	31.14	1.98	.....	7.66	.....	55.0	.....
8050	Nacogdoches	34.72	36.44	2.04	.....	6.90	.....	52.5	.....
8070	Denton	39.61	32.75	1.87	.....	6.30	.....	54.7	.....
8143	Pecos	32.64	39.01	.....	.....	5.66	.....	55.5	.....
8146	Lubbock	37.95	35.28	1.78	.....	6.62	.....	55.8	.....
8326	Temple	37.63	33.81	.....	.....	6.04	.....	53.6	.....
	Average	36.85	34.74	1.92	.....	6.86	.....	54.5	.....
	Crowder, 1914.								
8323	Main Station	39.20	32.94	.....	.....	6.23	.....	54.4	15.1
9785	Lubbock	36.51	34.88	.....	.....	5.81	.....	56.1	14.6
9364	Pecos	39.92	33.38	2.29	14.50	5.42	4.49	53.6	13.3
9401	Beeville	39.44	32.88	1.98	16.02	6.17	3.51	50.6	16.1
9446	Nacogdoches	36.07	35.56	1.64	16.43	6.05	4.25	55.9	14.4
9456	Spur	38.09	34.66	1.97	14.69	6.24	4.35	55.7	14.9
9466	Angleton	41.35	32.93	2.40	11.37	7.60	4.33	53.5	13.8
9719	Troup	37.37	35.39	2.08	14.11	6.14	4.91	55.8	14.6
	Average	38.49	34.08	2.06	14.69	6.28	4.37	54.4	14.6
	Half and Half, 1913.								
8038	Troup	41.20	30.94	1.95	.....	7.79	.....	54.0	.....
8080	Nacogdoches	35.97	34.75	1.97	.....	7.33	.....	53.5	.....
8074	Denton	40.16	31.87	2.22	.....	8.33	.....	54.6	.....
8106	Main Station	41.90	29.90	.....	.....	8.86	.....	54.5	.....
8144	Pecos	34.87	36.03	2.13	.....	5.95	.....	55.9	.....
8148	Lubbock	36.15	35.53	1.94	.....	6.01	.....	54.7	.....
	Average	38.38	33.17	2.04	.....	7.38	.....	54.5	.....
	Half and Half, 1914.								
9317	Main Station	40.58	31.54	.....	.....	5.98	.....	51.8	10.9
9786	Lubbock	36.56	33.75	.....	.....	5.57	.....	56.1	10.7
9363	Pecos	36.31	34.02	4.15	14.88	5.84	4.80	53.8	10.5
9402	Beeville	38.42	31.78	2.15	17.48	6.46	3.71	52.0	16.6
9447	Nacogdoches	39.53	33.55	2.30	14.38	5.99	4.25	56.9	10.8
9457	Spur	37.63	34.55	2.02	14.69	6.71	4.40	52.0	11.6
9467	Angleton	39.83	33.72	2.56	12.32	7.13	4.44	54.5	12.8
9720	Troup	35.98	33.42	3.10	16.97	5.86	4.67	56.0	10.9
	Average	38.11	33.29	2.71	15.32	6.19	4.38	54.1	11.9
	Lone Star, 1913.								
8032	Troup	38.97	30.53	.....	.....	8.27	.....	49.3	.....
8056	Nacogdoches	37.41	34.06	.....	.....	7.64	.....	55.0	.....
8064	Denton	39.69	30.73	.....	.....	8.61	.....	53.5	.....
8090	Main Station	35.23	30.13	2.12	.....	9.15	.....	50.1	.....
8140	Pecos	35.85	35.57	.....	.....	5.52	.....	56.0	.....
8145	Lubbock	36.90	33.03	.....	.....	6.70	.....	54.2	.....
8328	Temple	37.95	32.46	.....	.....	6.61	.....	52.0	.....
	Average	37.43	32.36	2.12	.....	7.50	.....	52.9	.....
	Lone Star, 1914.								
9320	Main Station	40.63	31.28	.....	.....	6.40	.....	52.0	12.2
9788	Lubbock	37.01	33.75	.....	.....	6.47	.....	54.0	12.7
9365	Pecos	39.81	32.06	2.50	15.12	5.68	4.83	50.2	13.9
9404	Beeville	41.21	30.94	1.85	15.61	6.80	3.59	49.5	15.2
9449	Nacogdoches	39.95	33.95	1.82	14.58	5.37	4.33	54.4	12.9
9459	Spur	38.25	32.51	2.10	17.88	5.00	4.26	53.2	11.3
9469	Angleton	41.48	32.69	2.21	12.49	6.83	4.30	53.6	10.8
9722	Troup	39.50	33.00	2.23	14.45	6.08	4.74	55.9	9.8
	Average	39.73	32.52	2.12	15.21	6.08	4.34	52.9	12.4
	Hendricks, 1913.								
8034	Troup	40.59	31.61	2.34	.....	8.40	.....	54.6	.....
8066	Denton	39.86	30.48	2.38	.....	8.63	.....	55.0	.....
8096	Main Station	38.18	29.07	.....	.....	9.19	.....	54.8	.....
	Average	39.54	30.39	2.36	.....	8.74	.....	54.8	.....

TABLE 42.—COMPOSITION OF COTTONSEED KERNELS, ARRANGED BY VARIETIES
—Continued.

Laboratory Number		Protein	Ether Extract	Crude Fiber	Nitrogen Free Extract	Water	Ash	Per Cent Kernels	Per Cent Lint
Hendricks, 1914.									
9324	Main Station	39.97	32.36			5.97		54.4	
9787	Lubbock	37.29	34.53			6.95		56.0	6.0
9362	Pecos	40.85	31.36	2.27	14.73	6.26	4.53	56.4	6.9
9403	Beeville	38.56	32.66	1.87	16.76	6.42	3.73	54.7	12.0
9448	Nacogdoches	39.06	33.61	1.61	15.36	6.11	4.25	58.2	9.1
9458	Spur	38.28	32.86	2.61	14.74	7.15	4.36	58.6	7.1
9468	Angleton	40.00	33.66	2.45	13.88	5.61	4.40	55.6	10.0
9721	Troup	40.40	31.43	2.43	14.06	6.99	4.69	58.8	5.7
	Average	39.30	32.81	2.21	14.92	6.43	4.33	56.6	7.1
Mebane Triumph, 1913.									
8036	Troup	41.36	31.08	2.39		8.54		51.8	
8052	Nacogdoches	37.01	34.53	1.94		6.71		53.0	
8084	Denton	39.86	31.20			6.55		53.4	
8092	Main Station	40.04	29.49	1.69		9.09		53.4	
8139	Pecos	36.22	36.37					55.4	
8155	Lubbock	38.20	34.22	1.95		6.41		55.4	
	Average	38.78	32.82	1.99		7.46		53.7	
Mebane Triumph, 1914.									
8322	Main Station	41.07	31.60			6.26		52.4	12.4
9789	Lubbock	17.17	34.23			6.55		54.5	12.1
9366	Pecos	37.54	33.26	2.10	17.00	5.42	4.68	52.2	7.7
9405	Beeville	39.51	33.23	2.05	15.28	6.41	3.52	51.0	
9450	Nacogdoches	37.73	34.10	1.30	17.14	5.55	4.18	54.6	12.8
9460	Spur	38.35	33.25	2.71	13.41	8.01	4.17	55.4	10.8
9723	Troup	39.57	32.06	2.45	14.41	6.70	4.81	55.2	10.9
	Average	38.71	33.12	2.12	15.37	6.41	4.27	53.6	11.1
Mortgage Lifter, 1913.									
8044	Troup	49.72	29.63	1.98		7.78		52.2	
8082	Nacogdoches	38.67	33.14	3.24		7.60		52.5	
8076	Denton	41.01	30.96			7.98		52.5	
8102	Main Station	42.36	28.98	2.15		6.52		51.4	
8147	Lubbock	36.16	35.93	1.96		5.66		54.5	
8153	Lubbock	38.95	33.17			6.98		53.7	
8327	Temple	40.13	32.29			6.52		53.3	
	Average	39.86	32.01	2.33		7.01		52.9	
Mortgage Lifter, 1914.									
9319	Main Station	43.44	29.21			6.16		50.0	13.7
9790	Lubbock	34.21	35.88			6.52		52.0	12.1
9369	Pecos	35.06	35.61	2.03	16.10	6.22	4.98	50.8	15.2
9406	Beeville	41.73	31.82	2.11	13.52	7.12	3.70	51.4	13.3
9451	Nacogdoches	38.08	34.04	2.20	14.61	6.60	4.47	55.8	16.0
9461	Spur	38.48	33.18	2.87	13.45	7.64	4.38	54.8	11.9
9470	Angleton	39.63	33.33	2.38	13.02	7.18	4.46	51.6	10.7
9724	Troup	41.20	32.41	2.30	13.28	5.78	5.03	53.6	12.9
	Average	38.98	33.19	2.32	14.26	6.70	4.55	52.5	13.2
Rowden, 1913.									
8046	Troup	40.76	31.55	1.77		7.62		54.0	
8054	Nacogdoches	35.22	37.06	1.92		6.53		53.5	
8078	Denton	35.84	32.50			8.77		54.7	
8104	Main Station	41.75	30.05	1.89		7.26		54.6	
8142	Pecos	32.69	37.95	2.80		5.86		55.3	
8150	Lubbock	35.61	35.51	1.73		5.55		55.6	
	Average	36.98	34.10	2.02		6.93		54.6	
Rowden, 1914.									
9325	Main Station	39.22	32.84	2.18	15.72	5.83	4.21	54.8	13.7
9791	Lubbock	36.34	34.58			6.79		56.2	14.2
9361	Pecos	33.54	36.49	2.25	17.15	5.66	4.91	53.4	18.6
9407	Beeville	37.23	32.73	1.84	16.86	7.57	3.77	52.5	10.7
9452	Nacogdoches	36.90	34.35	1.74	16.05	6.37	4.59	55.0	17.1
9462	Spur	36.80	34.03	2.45	14.64	7.50	4.58	55.7	14.4
9471	Angleton	41.38	32.60	2.09	11.78	7.78	4.37	52.4	14.0
9725	Troup	40.80	32.71	1.61	13.61	6.10	5.17	56.3	16.2
	Average	37.78	33.79	2.02	15.20	6.70	4.51	54.5	14.9

There is an average difference in the varieties, and also differences in the same variety when grown in different places. Some of the differences are due to soil conditions, climatic conditions, soil fertility, and the degree of maturity of the cotton when picked, as well as to the variety of the seed. The proportion of hull to kernel, however, affects decidedly the yield of oil. The seed richest in oil is the Black Rattler. This seed also contains the highest percentage of kernel, but the kernels are also rich in oil. The Cleveland Big Boll is poorest in oil, and contains the lowest percentage of kernels. In 1914, it carried 14.3 per cent. lint, or nearly 6 per cent. more than the Black Rattler, and with closer ginning should show up better in percentage of hulls and oil. The next lowest is the Lone Star, and the percentage of kernels is likewise low.

The seed of the Black Rattler and the Cleveland Big Boll were grown two years at seven or eight different substations, and showed, on the average, the differences given above. Table No. 43 shows that a comparison of the individual lots grown in the different stations shows the Black Rattler in every case to produce seed richer in oil and with a larger percentage of kernels than the Cleveland Big Boll. It is thus clearly evident that some varieties of cotton naturally produce seed combining more oil than other varieties. The average difference between these two varieties is 9 gallons per ton, which, at 40 cents per gallon, would be \$3.60 per ton difference in value.

It ought, therefore, to be possible to select varieties of cotton which produce a seed rich in oil. Cotton is, however, primarily grown for its lint, since the lint is much more valuable than the seed. Yield or quality of lint could not be sacrificed to yield of oil. It would be possible, however, to select seed which would at the same time produce a high quality and quantity of lint, and a high quantity of oil.

Apparently the proportion of kernels to meats offers a crude method for approximately judging extreme differences in the quantity of oil produced from different seeds. This requires further study.

COMPOSITION OF SEED FROM DIFFERENT TEXAS LOCALITIES.

Table No. 43 contains the analyses of a number of samples of seed as made by a Texas oil mill from seed secured from various parts of the State. The available yields are calculated on a basis of 44.6 per cent. protein and 6.8 per cent. fat in the meal, and a milling loss of 7 per cent. The mill can, of course, afford to pay a higher price for seed that contain larger quantities of oil,—or, to take it the other way, they cannot afford to pay so much for seed low in oil. The table shows that different lots of seed from the same locality may vary considerably in oil content. At Goliad, for example, there is the difference between 37 and 44 gallons, or 7 gallons oil per ton in two different shipments. The average for Goliad (seven lots) is 39 gallons, and for Robstown 36 gallons, a difference of 3 gallons per ton, or \$1.20 at 40 cents per gallon.

TABLE 43.—COMPOSITION OF TEXAS COTTONSEED, AS FOUND BY AN OIL MILL.

Date	Origin	Weight 100 Seed	Per Cent Meats	Per Cent Water	Per Cent Oil	Per Cent Ammo- nia	Per Cent Dam- aged	Per Cent Rotten	Oil Gallons	Oil Lbs.	Hulls and Lint Lbs.	Meal Lbs.
Dec. 13, 1915	South West Texas (Average)	10,5835	52.72	7.72	16.32	4.21	3	.....	34	255.4	699.6	905
Dec. 13, 1915	West Texas (Average)	11,7032	54.06	7.69	11.62	4.21	2.9	.....	39	281.2	663.8	905
Dec. 13, 1915	South Texas (Average)	11,5239	52.31	7.56	17.66	4.14	3.1	.....	39	283.3	676.9	889.8
Dec. 13, 1915	Central Texas (Average)	11,5806	52.95	7.63	17.65	4.21	2.5	.....	39	282.1	662.9	905
Dec. 13, 1915	East Texas (Average)	11,7262	53.80	7.24	17.92	4.21	3.1	1.8	40	299.5	688.7	871.8
Oct. 9, 1915	Austin	11,7869	54.68	7.00	17.22	4.33	4	.....	37	282	648	930
Oct. 20, 1915	Austin	11,9400	54.00	8.48	18.84	4.45	.....	1	41	313	590	957
Oct. 30, 1915	Arp	10,8553	53.60	6.13	17.76	4.13	10	.....	39	296	677	887
Sept. 16, 1915	Aqua Dulce	10,7497	51.94	8.64	16.38	4.22	2	.....	35	264	689	907
Oct. 30, 1915	Appleby	11,1202	49.12	5.90	16.15	3.93	4	.....	35	267	751	842
Oct. 30, 1915	Anderson	11,6748	50.42	7.54	17.97	3.82	4	.....	40	304	735	821
Oct. 30, 1915	Burnett	11,9133	53.44	5.33	17.56	4.16	2	.....	38	291	675	894
Oct. 22, 1915	Bryan	10,6986	50.83	8.69	18.29	4.15	6	1	40	306	663	891
Oct. 18, 1915	Bryan	11,2872	52.60	8.36	17.44	4.29	.....	.....	38	287	651	922
Oct. 13, 1915	Brookshire	11,6250	50.80	7.60	17.62	4.04	2	4	39	294	699	867
Oct. 23, 1915	Brenham	11,9281	53.93	7.56	18.85	4.04	2	.....	42	319	699	872
Oct. 30, 1915	Bryantown	11,6495	50.04	8.12	16.81	3.83	6	6	37	280	738	840
Sept. 19, 1915	Bloomington	11,3707	52.07	8.90	17.15	3.83	6	.....	38	288	729	823
Oct. 25, 1915	Blanchard	13,1400	56.30	6.06	19.10	4.32	4	.....	44	332	599	929
Oct. 30, 1915	Blair	11,5790	51.31	6.03	17.82	4.10	.....	2	39	297	682	881
Oct. 24, 1915	Benchly	11,0328	54.97	7.56	16.59	4.26	.....	.....	38	287	667	916
Sept. 24, 1915	Beville	10,0931	50.98	6.32	16.52	4.17	4	.....	32	251	653	881
Aug. 16, 1915	Beville	10,5357	50.18	6.02	16.47	4.19	.....	.....	38	289	653	918
Aug. 13, 1915	Beville	11,1307	50.81	8.92	17.63	3.80	4	.....	41	309	651	900
Aug. 10, 1915	Beville	10,4758	50.18	8.88	16.92	4.20	6	.....	38	289	651	918
Aug. 12, 1915	Beville	10,5097	50.83	8.58	16.62	4.20	2	.....	41	309	651	918
Aug. 14, 1915	Beville	10,6977	50.83	8.58	16.62	4.20	2	.....	38	289	651	918
Aug. 14, 1915	Beville	10,1077	52.32	7.18	16.71	4.31	8	.....	36	274	686	900
Oct. 10, 1915	Beville	11,8360	54.32	7.19	16.42	3.83	.....	.....	36	274	686	900
Oct. 22, 1915	Bellinger	11,8046	53.08	7.88	16.95	4.12	4	2	37	283	704	865
Nov. 5, 1915	Bellinger	11,7724	53.08	8.15	17.82	4.12	7	.....	37	283	693	889
Oct. 23, 1915	Bastrop	11,8396	53.41	7.20	18.05	4.20	.....	.....	39	293	680	892
Oct. 8, 1915	Bastrop	12,0475	53.39	7.74	17.80	4.21	2	2	39	293	680	892
Sept. 16, 1915	Bastrop	11,7287	53.06	7.98	16.04	4.08	4	2	35	285	748	848
Sept. 16, 1915	Bastrop	12,3196	53.72	7.40	19.60	4.08	.....	.....	44	333	651	876
Oct. 21, 1915	Cuero	11,4355	52.92	8.40	17.17	4.10	.....	.....	37	284	690	882
Oct. 11, 1915	Cuero	11,5157	53.32	7.75	17.23	4.11	.....	.....	38	286	690	882
Sept. 23, 1915	Cuero	11,2777	51.33	7.83	17.76	4.22	4	.....	39	294	661	905
Sept. 24, 1915	Cuero	11,4927	55.30	7.59	17.96	3.74	.....	.....	40	305	715	840

Sept. 20, 1915	Cuero	11.5416	51.321	7.481	18.391	4.071	2.011	411	3091	6771	8741
Sept. 19, 1915	Cuero	12.8449	52.701	8.531	16.391	4.191	2.011	351	2671	6971	9001
Aug. 18, 1915	Cuero	12.1867	52.551	8.531	17.611	3.831	2.011	391	2971	7411	8221
Aug. 15, 1915	Cuero	11.4527	53.491	6.381	17.311	3.851	2.011	381	2891	7231	8481
Sept. 12, 1915	Cuero	11.3751	52.141	7.301	17.041	3.901	2.011	381	2861	7641	8101
Oct. 25, 1915	Crosby	9.8506	51.201	6.891	16.201	4.311	4.141	341	2621	6491	9271
Oct. 24, 1915	Crockett	11.6114	54.141	6.891	16.061	4.141	2.011	421	3211	6491	8901
Oct. 30, 1915	Courtney	11.0496	52.151	6.761	16.661	4.281	4.141	361	2711	6681	9211
Oct. 23, 1915	Crosby	8.8249	44.751	6.761	13.731	4.651	2.011	261	2011	6591	10001
Oct. 12, 1915	Corsicana	11.4825	54.801	7.021	18.041	4.441	2.011	391	2971	6971	9551
Oct. 30, 1915	Corsicana	11.6358	54.561	7.951	16.201	4.531	2.011	351	2691	6171	9741
Oct. 23, 1915	Cornal	11.1740	52.461	5.841	17.281	3.881	2.011	391	2901	7361	8341
Oct. 23, 1915	Clay	11.5376	51.941	7.631	16.351	4.251	2.011	361	2701	6771	9131
Sept. 25, 1915	Charlotte	10.4714	53.501	6.811	16.371	4.211	2.011	361	2741	6821	9041
Oct. 30, 1915	Casa Blanca	10.4144	51.761	7.261	17.221	4.221	10.101	371	2831	6701	9071
Oct. 30, 1915	Casa Blanca	10.8282	53.001	5.761	16.101	4.351	2.011	341	2591	6661	9351
Oct. 25, 1915	Carthage	11.8562	53.621	5.601	19.571	4.071	2.011	441	3321	6541	8741
Oct. 23, 1915	Cameron	11.6210	53.621	7.521	16.531	4.191	2.011	401	3011	6591	9001
Oct. 7, 1915	Caldwell	10.1529	52.411	7.521	16.531	4.131	2.011	371	2781	6941	8881
Oct. 7, 1915	Caldwell	10.1585	48.501	8.011	16.761	4.141	2.011	361	2751	6951	8901
Oct. 12, 1915	Dillon	9.5474	50.081	7.021	19.661	4.271	14.141	331	2521	6551	8881
Sept. 20, 1915	Dille	11.5974	51.591	7.051	19.321	4.101	10.101	331	2521	6911	9171
Nov. 5, 1915	Floresville	11.2654	53.311	8.031	16.511	4.431	2.011	401	3051	6631	8821
Oct. 30, 1915	Elkhart	11.2854	53.311	8.031	16.511	4.431	2.011	391	2921	6161	8521
Oct. 25, 1915	Goliad	11.8847	54.311	7.681	16.871	4.051	2.011	361	2761	7641	8201
Oct. 7, 1915	Goliad	11.8847	54.211	7.681	16.871	4.161	6.061	371	2771	6591	8941
Aug. 16, 1915	Goliad	11.9845	51.121	6.131	17.851	4.161	4.161	371	2811	6371	8821
Aug. 12, 1915	Goliad	12.1517	54.071	7.131	16.361	4.201	4.061	331	2901	6681	9021
Aug. 12, 1915	Goliad	11.5498	51.071	6.601	17.331	4.341	4.061	441	3301	6411	8891
Aug. 10, 1915	Goliad	12.4092	51.211	6.601	18.331	4.361	6.061	331	2871	6331	9401
Aug. 14, 1915	Goliad	11.8581	51.711	6.601	17.361	4.361	4.171	411	3101	6271	9231
Oct. 8, 1915	Gonzales	11.6570	52.311	8.271	18.301	4.171	6.061	381	3051	6391	9161
Sept. 13, 1915	Gonzales	12.1477	52.271	8.761	18.341	4.261	4.061	401	3071	6921	8611
Aug. 13, 1915	Gonzales	10.8839	52.091	6.841	19.021	3.981	2.011	401	3231	6971	8951
Jan. 14, 1915	Gonzales	11.7908	53.501	7.141	17.701	4.131	2.011	421	3231	6971	8951
Oct. 23, 1915	Gonzales	11.4297	51.901	7.281	17.041	4.371	2.011	391	2961	6251	8391
Oct. 23, 1915	Grapeland	11.5360	54.011	7.071	16.871	4.371	2.011	361	2741	6451	8401
Sept. 20, 1915	Green	11.1892	52.161	7.011	17.801	4.131	2.011	391	2971	6951	8851
Sept. 23, 1915	Green	11.3885	54.411	7.861	17.081	4.151	2.011	391	2971	6881	8851
Sept. 23, 1915	Green	11.0023	54.141	7.121	16.701	4.151	2.011	361	2771	7081	8711
Oct. 12, 1915	Groesbeck	10.8737	51.441	7.921	16.101	4.251	2.011	361	2601	6731	9141
Nov. 5, 1915	Hallettsville	12.4044	54.311	8.151	18.081	4.251	2.011	341	3231	6901	9141
Oct. 8, 1915	Hallettsville	11.6525	50.851	8.031	17.921	3.831	2.011	431	3021	6901	8471
Oct. 8, 1915	Henderson	11.9116	50.801	7.261	17.601	3.831	2.011	431	3021	7361	8221
Oct. 22, 1915	Henderson	11.8810	54.131	8.611	17.321	3.951	2.011	391	2961	7681	7931
Sept. 16, 1915	Karnes City	10.3457	54.541	7.381	17.801	4.251	2.011	381	2891	7231	8431
Sept. 16, 1915	Kenedy	10.8593	50.231	7.581	18.381	4.011	2.011	391	2951	6511	9141
Aug. 16, 1915	Kenedy	11.6513	54.601	5.741	17.791	4.011	2.011	411	3111	7151	8341
Aug. 13, 1915	Kenedy	11.0540	53.961	6.601	17.581	4.291	2.011	391	2981	7011	8611
July 4, 1915	Kenedy	11.0287	54.041	6.901	17.441	4.291	2.011	381	2901	6901	9211
Nov. 5, 1915	Kosse	11.8032	53.541	8.001	18.231	3.941	2.011	381	2871	6531	8471

TABLE 42.—COMPOSITION OF TEXAS COTTONSEED, AS FOUND BY AN OIL MILL.

Date	Origin	Weight 100 Seed	Per Cent Meats	Per Cent Water	Per Cent Oil	Per Cent Ammo- nia	Per Cent Dam- aged	Per Cent Rotten	Oil Gallons	Oil Lbs.	Hulls and Lint Lbs.	Meal Lbs.
Sept. 20, 1915	La Ward	12,0702	50.60	11.16	15.90	3.82		8		213	681	816
Oct. 20, 1915	Leggett	9,9445	52.12	6.30	16.17	4.31			35	34	672	927
Oct. 22, 1915	Liberty Hill	11,3492	53.19	7.87	17.13	4.19		1	37	282	678	900
Aug. 10, 1915	Lindeman	11,4575	53.02	4.26	18.56	4.11	4		37	312	665	883
Oct. 25, 1915	Livingston	11,1521	52.81	7.25	18.45	4.18		6	41	309	662	889
Sept. 13, 1915	Livingston	13,1753	47.41		17.95	3.57		12	40	310	784	766
Oct. 7, 1915	Livingston	11,2667	52.44	7.11	18.12	3.76		4	41	303	749	868
Oct. 8, 1915	Lovelady	11,6885	52.53	7.97	16.97	3.99			37	282	724	857
Oct. 9, 1915	Lovelady	11,2788	53.59	6.80	17.10	3.67	2		38	291	781	788
Nov. 5, 1915	Luling	11,9783	55.42	8.01	17.48	3.95			39	293	719	848
Sept. 16, 1915	Luling	11,0373	52.72	7.30	17.61	4.11			39	293	683	884
Oct. 7, 1915	Luling	11,9892	46.48	5.96	16.18	4.14		4	35	263	707	890
Oct. 22, 1915	Manor	11,8514	54.20	7.20	18.37	4.28		1	40	305	636	919
Oct. 7, 1915	Manor	11,8514	51.55	7.20	17.12	4.02		6	37	284	711	865
Sept. 16, 1915	Marion	12,5167	54.21	7.48	17.12	4.00			38	284	720	859
Oct. 22, 1915	Marion	11,7350	53.44	8.33	17.32	4.01		3	38	288	711	861
Oct. 30, 1915	Marion	11,4490	52.91	6.00	17.57	4.16		6	38	291	674	895
Oct. 15, 1915	Mathis	11,2010	51.98	7.56	17.56	3.81		2	39	297	852	809
Sept. 15, 1915	Mandow	10,8466	52.18	7.08	18.07	3.92			40			
Aug. 14, 1915	Mandow	10,4899	51.55	7.04	16.41	4.45		6	35	284	650	956
Oct. 19, 1915	Mexia	11,6151	52.35	6.22	16.95	4.04			37	281	712	867
Oct. 30, 1915	Montgomery	11,4763	52.70	7.68	17.92	4.16			39	298	669	893
Oct. 13, 1915	Mt. Enterprise	11,5151	52.70	7.68	17.92	4.16			40	301	700	859
Oct. 25, 1915	Nacogdoches	11,8560	51.90	7.03	17.95	4.00		4	37	282	637	941
Oct. 8, 1915	Nacogdoches	11,9327	51.00	7.37	17.22	4.38			41	312	642	906
Nov. 5, 1915	New Braunfels	12,2669	53.92	8.08	18.64	4.22			37	282	692	881
Oct. 9, 1915	New Braunfels	11,9816	52.93	6.86	17.30	4.10		6	38	287	692	881
Sept. 19, 1915	New Braunfels	12,1742	50.86	8.41	15.77	4.15			34	255	713	892
Sept. 21, 1915	New Braunfels	12,0521	52.71	7.25	18.53	3.98		2	41	313	692	855
Aug. 16, 1915	New Braunfels	12,6619	52.62	6.92	16.89	3.73		2	37	283	775	802
Oct. 15, 1915	New Braunfels	12,1071	53.69	7.67	17.95	4.22			39	298	601	907
Sept. 20, 1915	Nordheim	10,3911	51.78	7.20	16.48	4.17		4	35	289	695	896
Aug. 12, 1915	Nordheim	10,9290	52.87	6.72	19.56	4.39			41	309	609	942
Aug. 14, 1915	Nordheim	11,1561	52.47	6.81	17.43	4.31		6	35	286	742	932
Aug. 16, 1915	Nordheim	11,5870	49.08	6.80	16.96	4.03			39	291	703	866
Sept. 24, 1915	Oakwood	11,1762	55.49	7.90	19.21	3.75			43	325	728	806
Sept. 19, 1915	Odem	11,1612	53.37	8.37	16.99	4.23			37	278	677	905
Sept. 16, 1915	Odem	11,0842	54.54	8.00	15.14	4.26		4	32	241	704	915
Aug. 13, 1915	Odem	10,7896	53.70	6.84	16.91	4.27		2	27	277	667	916
Aug. 10, 1915	Odem	11,7865	51.19	6.78	17.55	4.04		4	39	292	700	868
Oct. 25, 1915	Oerton	11,2965	53.20	6.70	17.91	4.07		6	39	299	686	875
Oct. 9, 1915	Palatine	11,8502	54.92	7.20	17.59	3.95		2	39	295	717	848
Oct. 23, 1915	Palatine	11,8845	54.70	7.25	18.88	4.09			42	319	662	879

Oct. 30.	1915 Paxton.	10.5226	54.62	5.86	18.07	3.85	0	42	318	710	826
Sept. 20.	1915 Pearsall.	10.7862	50.64	7.28	15.84	4.48	6	33	253	670	937
Oct. 7.	1915 Robstown.	11.1420	51.45	6.88	16.80	4.27	4	36	275	678	919
Sept. 20.	1915 Robstown.	10.5989	53.93	7.53	17.89	4.41	4	39	295	618	947
Sept. 19.	1915 Robstown.	10.9250	54.04	6.95	16.50	4.29	2	35	268	654	922
Sept. 19.	1915 Robstown.	10.7727	53.35	7.00	15.52	4.48	2	32	246	654	960
Aug. 13.	1915 Robstown.	10.6272	53.03	6.72	17.07	4.46	2	37	278	621	957
Aug. 15.	1915 Robstown.	10.7846	51.45	7.67	16.29	4.18	2	35	264	710	886
Nov. 5.	1915 Rosebud.	12.4555	55.66	9.95	18.63	4.25	2	41	311	635	914
Sept. 23.	1915 Rosebud.	10.5942	53.59	8.05	16.41	4.40	4	35	265	646	946
Nov. 5.	1915 Roseburg.	10.5954	51.19	8.12	16.13	4.28	4	34	260	680	920
Aug. 12.	1915 Runge.	10.7431	52.26	7.72	17.63	4.20	6	39	292	667	901
Sept. 23.	1915 St. Paul.	10.5599	57.00	7.84	17.96	4.42	4	39	294	616	950
Oct. 30.	1915 Salina.	11.5153	54.21	7.88	18.17	4.05	4	40	305	684	871
Oct. 5.	1915 San Augustine.	12.7317	54.31	8.20	18.00	4.09	1	40	301	680	879
Oct. 22.	1915 Seguin.	12.0924	53.85	7.20	18.19	4.12	3	40	304	671	885
Oct. 8.	1915 Seguin.	11.8200	52.05	7.36	17.27	4.09	6	38	287	696	879
July 17.	1915 Seguin.	11.9648	55.78	8.37	18.77	3.75	4	33	231	739	800
Sept. 24.	1915 Seguin.	11.4475	54.24	7.31	18.93	4.11	4	42	319	684	884
Aug. 14.	1915 Seguin.	12.3550	52.54	6.38	16.18	4.36	2	34	261	663	936
Aug. 16.	1915 Seguin.	11.4287	53.30	5.79	17.32	4.19	2	38	285	675	900
Aug. 16.	1915 Seguin.	11.8656	54.18	7.02	17.88	4.22	4	39	296	556	908
Sept. 4.	1915 Seguin.	11.2040	54.18	7.00	15.80	4.20	4	34	256	704	900
Oct. 25.	1915 Shepherd.	10.8719	52.64	6.98	18.62	4.27	4	42	310	638	918
Oct. 13.	1915 Shiner.	12.5267	51.35	8.15	17.96	4.45	4	39	295	609	958
Sept. 15.	1915 Shiner.	11.7387	48.85	7.12	18.42	4.28	4	40	305	635	920
Sept. 1.	1915 Shiner.	12.0938	53.22	6.97	17.03	4.09	2	37	281	700	879
Sept. 15.	1915 Shiner.	12.4288	54.38	7.86	18.97	4.13	6	43	323	649	888
Aug. 16.	1915 Shiner.	12.2902	50.76	7.18	19.12	3.94	4	36	272	686	847
Oct. 13.	1915 Shire.	9.9048	50.94	7.81	16.54	4.14	2	36	272	700	888
Sept. 9.	1915 Skidmore.	10.4296	50.48	7.12	16.62	4.19	4	36	272	688	900
Sept. 23.	1915 Stafford.	12.0249	54.31	7.43	16.74	3.88	4	38	279	747	834
Oct. 7.	1915 Stafford.	12.0122	53.46	7.55	17.18	4.23	4	37	282	650	908
Sept. 13.	1915 Sugarland.	12.5001	53.07	15.52	16.58	3.97	2	36	275	731	854
Sept. 20.	1915 Sugarland.	11.7654	50.07	7.98	17.35	3.95	2	38	280	722	848
Aug. 14.	1915 Victoria.	11.8628	54.02	7.39	18.41	4.02	2	41	310	686	864
Aug. 10.	1915 Victoria.	11.1689	45.53	6.75	17.83	4.07	6	39	301	563	996
Sept. 16.	1915 Vail.	10.7077	55.84	8.50	18.43	4.64	4	40	301	639	924
Sept. 16.	1915 Vail.	10.6448	55.01	7.42	16.75	4.30	4	39	297	639	907
Aug. 16.	1915 Vail.	11.1876	55.05	8.15	17.85	4.22	4	36	276	677	853
Nov. 3.	1915 Taylor.	11.9040	55.05	8.02	16.11	3.89	2	39	300	657	854
Oct. 30.	1915 Thomaston.	11.5027	52.82	6.81	16.52	4.13	6	40	309	740	854
Aug. 12.	1915 Thomaston.	12.0465	55.94	8.09	17.67	4.16	4	38	286	639	894
Aug. 10.	1915 Thomaston.	11.9010	52.42	6.81	17.67	4.16	4	38	283	673	912
Aug. 14.	1915 Thomaston.	12.282	51.81	6.92	17.91	4.09	4	38	281	664	894
Oct. 28.	1915 Thomaston.	12.7328	53.01	6.92	17.91	4.09	4	38	281	757	912
Oct. 23.	1915 Thorndale.	11.6520	52.91	7.12	17.88	4.26	4	41	306	644	868
Oct. 23.	1915 Timpson.	11.9721	52.88	7.32	18.78	4.50	4	41	311	581	900
Sept. 19.	1915 Tynan.	10.8962	53.39	8.81	15.76	4.46	4	34	261	639	900

TABLE 43.—COMPOSITION OF TEXAS COTTONSEED, AS FOUND BY AN OIL MILL.

Date	Origin	Weight 100 Seed	Per Cent Meats	Per Cent Water	Per Cent Oil	Per Cent Ammo- nia	Per Cent Dam- aged	Per Cent Rotten	Oil Gallons	Oil Lbs.	Hulls and Lint Lbs.	Meal Lbs.
Oct. 23, 1915	Waelder	11.5264	53.24	7.37	17.87	4.27	6	2	39	296	647	917
Oct. 8, 1915	Waelder	12.0117	51.67	7.59	17.13	4.14	.....	.....	37	282	688	890
Sept. 21, 1915	Waelder	10.7727	53.70	7.04	17.94	4.09	.....	.....	40	300	682	879
Oct. 8, 1915	Weimar	12.1657	50.00	7.43	16.90	4.14	4	4	37	278	692	890
Sept. 24, 1915	Weimar	12.3438	55.85	7.38	17.76	4.14	.....	.....	39	295	676	889
Sept. 16, 1915	Weimar	12.4560	49.69	8.38	16.46	4.17	12	.....	35	269	695	896
Oct. 25, 1915	Westhoff	10.0950	52.33	7.00	18.03	3.75	.....	2	40	306	748	806
Oct. 8, 1915	Westhoff	10.5811	52.41	7.00	17.21	4.08	6	.....	37	283	700	877
Sept. 20, 1915	Westhoff	11.0576	51.35	7.31	17.64	4.10	4	.....	39	294	685	881
Sept. 23, 1915	Westhoff	10.9512	53.38	8.04	16.36	3.99	.....	.....	36	270	733	857
Sept. 4, 1915	Westhoff	11.5095	49.08	7.86	17.24	3.90	4	.....	38	288	734	838
Sept. 4, 1915	Westhoff	11.5301	51.88	6.65	17.21	4.19	.....	.....	38	284	676	900
Sept. 15, 1915	Westhoff	11.1876	52.18	7.21	17.40	4.02	2	.....	38	290	707	883
Oct. 30, 1915	Whitehouse	11.8073	54.09	5.63	18.12	4.12	.....	6	40	303	672	885
Oct. 8, 1915	Willis	11.8754	50.35	8.05	17.42	4.09	.....	.....	35	289	693	878
Sept. 18, 1915	Woodsboro	11.8684	51.17	7.21	16.30	4.31	8	.....	35	264	669	927
Sept. 16, 1915	Woodsboro	10.9835	54.83	7.47	18.66	4.27	2	.....	41	312	632	916
Oct. 30, 1915	Woodsboro	11.3809	54.43	5.84	18.39	4.35	.....	40	303	303	579	978
Sept. 1, 1915	Wortham	11.7225	51.70	7.21	17.21	4.16	2	.....	37	269	676	900
Sept. 18, 1915	Yoakum	11.7867	52.32	8.05	16.43	4.12	.....	.....	35	269	706	885
Aug. 13, 1915	Yoakum	11.7867	52.32	8.05	17.60	4.11	.....	.....	39	292	705	885
Aug. 13, 1915	Yoakum	11.7867	52.32	8.05	17.60	4.11	.....	.....	42	315	685	882
Sept. 16, 1915	Yorktown	10.8943	52.56	6.74	18.09	4.10	4	.....	40	303	697	900
Aug. 16, 1915	Yorktown	10.6102	52.86	5.14	18.13	3.75	4	.....	35	261	674	895
Aug. 16, 1915	Yorktown	10.6102	40.42	5.14	18.13	3.90	8	.....	45	343	687	880
Aug. 12, 1915	Yorktown	11.2030	53.79	7.05	18.71	3.90	2	.....	42	314	696	890
Aug. 12, 1915	Yorktown	11.5509	50.27	9.19	18.18	3.88	6	.....	40	307	619	834
	Average	11.4200	52.62	7.30	17.49	4.13	3	0.8	38	291	681	887

Since the shipments from the same town may come from different localities in the tributary district, and since soil, season, variety, and ripeness affect the composition, a number of analyses from each locality, averaged for several years, would be required to bring out clearly the locality differences. Seed from Bryan, for example, may come from cotton on the upland, or from cotton grown in the Brazos bottom. The table, however, is very valuable, and the writer hopes that other oil mills in the State will supplement this data from analyses made for them.

COMPOSITION OF SELECTIONS.

Table No. 44 contains analyses of a number of selections of the same variety of seed, grown under similar conditions at College Station by Mr. Jobson. In order to avoid the influence of varying quantities of lint, the seed were delinted by acid before they were cut. The average oil content of the seed is 30.66 per cent., and the variation is from 28.34 to 32.50 per cent., or 4.16 per cent. oil in the kernels. Eight of the samples, out of the 26, contain more than 31 per cent. oil. The average percentage of oil in the seed is 18.1 per cent. The highest is 20.64 and the lowest is 16.58 per cent. The highest oil is associated with the highest percentage of kernels.

TABLE 44.—COMPOSITION OF SEED KERNELS 1915 DELINTED BY ACID.

Lab. No.	Description	Protein	Ether Extract	Water	Per Cent Kernels	Per Cent Oil in Seed
10157 Exp. 729	B165.....	41.80	30.35	5.37	57.1	17.33
10158 Exp. 729	B164.....	39.19	32.50	4.72	63.5	20.64
10159 Exp. 729	B 1.....	42.27	29.75	5.78	60.1	17.88
10160 Exp. 729	B 3.....	40.56	28.34	6.04	58.5	16.58
10161 Exp. 729	B123.....	42.88	30.25	5.76	58.7	17.76
10162 Exp. 729	B 78.....	38.93	31.31	5.38	60.6	18.97
10163 Exp. 729	B217.....	41.06	31.08	5.23	59.4	18.46
10164 Exp. 729	B206.....	42.28	30.94	4.75	58.5	18.10
10165 Exp. 729	B 64.....	41.51	30.63	4.94	58.4	17.89
10166 Exp. 729	B205.....	40.57	31.40	4.90	60.5	19.10
10167 Exp. 729	B118.....	41.30	31.21	4.70	58.8	18.35
10168 Exp. 729	B 79.....	41.62	30.77	5.13	59.4	18.28
10169 Exp. 729	B215.....	41.74	30.47	4.66	57.9	17.65
10170 Exp. 729	B175.....	40.18	31.20	5.08	58.5	18.25
10171 Exp. 729	B 77.....	40.00	30.50	5.57	60.6	18.48
10172 Exp. 729	B135.....	42.55	29.72	5.58	60.7	18.04
10173 Exp. 729	B211.....	41.75	30.23	5.10	58.7	17.75
10174 Exp. 729	B126.....	41.19	30.47	5.13	59.1	18.01
10175 Exp. 729	B149.....	42.04	32.18	5.43	57.0	18.34
10176 Exp. 729	B124.....	40.51	30.57	5.83	59.0	18.04
10177 Exp. 729	B201.....	42.56	30.20	5.48	55.6	16.79
10178 Exp. 729	B214.....	41.31	30.52	5.46	58.4	17.82
10179 Exp. 729	B129.....	42.48	30.97	5.64	61.1	18.92
10180 Exp. 729	B171.....	43.07	30.37	6.16	59.8	18.16
10181 Exp. 729	B130.....	40.69	31.44	5.90	58.4	18.36
10182 Exp. 729	B183.....	40.97	29.81	5.82	56.6	16.87
Average.....		41.34	30.66	5.36	59.0	18.11

The following selections contain over 18.6 per cent. oil: B 164, B 78, B 205, B 129. The following selections contain less than 17.6 per cent. oil (0.5 per cent. less than the average): B 165, B 3, B 201, B 183. Some of these selections will be planted by the Division of Agronomy to see what character of seed they will produce.

RELATION OF COMPOSITION OF SEED TO COMPOSITION OF MEAL.

While the composition of the seed affects the yield of meal and cake, as manufactured, rather than the composition on a protein basis, there is yet a relation between the composition of the seed and the composition of the meal made from it.

This is reflected in the standards adopted for cottonseed meal already given, which vary somewhat from State to State, being highest of all in Texas.

There is also a relation between the protein and crude fiber content of the meal, and the quality of the seed from which it is made. Thus if two meals of the same protein content are made, one from seed of high protein content, and one from seed of low protein content, the crude fiber content will be higher in the meal made from seed of a high protein content, and lower in the meal made from seed with a lower protein content. By taking the protein and crude fiber into consideration together, one may get an idea as to the quality of the original seed as regard protein. The varying amount of lint present affects the accuracy of the estimate. Of course, it is not possible to form an opinion as to the amount of oil present in the original seed.

Table No. 45 shows the average composition of the kernel residue from a number of seed, based on 14 per cent. fat and water content, and also the average composition of cottonseed hulls on the same basis.

TABLE 45.—AVERAGE COMPOSITION OF COTTONSEED KERNELS ON 15% WATER AND FAT BASIS.

	No. Average.	Protein	Ether extract	Crude Fiber	Nitrogen Free Extract	Water	Ash
Texas Seed, 1913.	66	54.32	7.00	3.01	21.43	8.00	6.24
Texas Seed, 1914.	59	54.70	7.00	3.10	21.00	8.00	6.20
Texas and Oklahoma Seed Committee.	14	54.36	7.00	2.55	22.08	8.00	6.01
Eastern Seed, Committee.	32	49.80	7.00	2.79	25.24	8.00	7.20
Cottonseed Hulls, from as named, average		3.30	6.00	42.35	36.91	9.00	2.44

If one pound of cottonseed hulls replaces one pound kernel residue in the residue of the composition given in Table No. 37, we would have from Texas seed, fat and water remaining constant, on an average, 0.033 pounds protein, taking the place of 0.543 pounds of protein, or a decrease of 0.51 pounds protein. We would also have 0.424 pounds crude fiber taking the place of 0.03 pounds crude fiber, or an increase of 0.39 pounds crude fiber. Thus for a decrease of one pound protein we would have an average increase of 0.76 pounds crude fiber.

Proceeding in the same way with the kernel residue from Eastern seed, we find that $39 = .84$ pounds crude fiber takes the place of

.465

one pound protein.

Thus, the protein content of the original kernel residue could be approximately calculated from the following formula:

$$N = P + \frac{F-3}{L}$$

Where N = protein in seed residue.

P = protein in meal.

F = crude fiber in meal.

L = 0.84 for Eastern seed and .76 for Texas or Oklahoma seed.

If the fat and water content of the meal is far from 15 per cent., it should be calculated to this basis for accurate results. However, on account of the variation of relative proportions of lint and kernel in meal, this is not necessary. For rapid and approximate calculations, we may use the following formula:

$$N = P + (F-3) 1.2$$

For a still more rapid and approximate check, the protein and crude fiber may be simply added. This is a useful rough check on analytical work, since the sum of the protein and crude fiber is fairly constant in a given locality.

The fact must be recognized that seed vary in composition. The preceding formula gives a method by which the protein content of the original kernel residue may be estimated from the analysis of the meal.

The same method may also be used in estimating the protein content of the meal that would have a desired crude fiber content.

Thus suppose a meal from Eastern seed contains 36 per cent. protein and 11 per cent. crude fiber. What per cent. of protein would it contain with 9 per cent. crude fiber?

$$\begin{aligned} N &= P + (11-9) 1.2 \\ &= 36 + 2.4 = 38.4 \text{ per cent. protein.} \end{aligned}$$

A meal contains 42 per cent. protein and 6 per cent. crude fiber. What percentage of crude fiber will it contain with 36 per cent. protein?

$$\begin{aligned} (42-36) .8 &= 4.8 \\ 6 + 4.8 &= 10.8 \text{ per cent crude fiber.} \end{aligned}$$

If the probable maximum crude fiber, and not the average, is to be considered, as is necessary in making a guarantee under feed control laws, the safest plan is to estimate that 1 per cent. crude fiber replaces 1 per cent. protein. Thus the guarantee on the meal containing 42 per cent. protein above cited would be 12 per cent. crude fiber.

ESTIMATION OF LINT ON COTTON SEED.

The writer has seen no published method for the estimation of lint on cotton seed, though he is aware of the fact that methods, involving the use of sulphuric acid, are in use by some commercial chemists.

Preliminary Work.—The preliminary work included a study of the

strength of acid, the time and manner of drying, and the effect of the acid on the hulls themselves, without lint.

The general method used in the preliminary tests is described as follows:

Weigh about 5 grams seed into a dry beaker, add about 10 c.c. concentrated sulphuric acid, and stir continuously with a glass rod until all lint except that on the tip of the seed has dissolved. This will take about one minute. Pour acid and seed on a perforated porcelain plate in a funnel; drain and wash thoroughly, adding a quantity of water at once so as to avoid heating the acid. Wash the seed thoroughly, spread on filter paper, dry in steam oven for thirty minutes and weigh.

Effect of Strength of Acid.—This was tested by adding 10 c.c. water to 100 c.c. acid, allowing to cool, and then using it to delint 5 grams cottonseed. The delinted seed were dried in a steam oven for twenty minutes, exposed to the air over night, and weighed.

A similar test was made with 20 c.c. water to 100 c.c. acid.

TABLE 46.—EFFECT OF STRENGTH OF ACID IN AMOUNT OF LINT.

Laboratory Number	Conc. Acid		10 c.c. Water to 100 c.c. Water		20 c.c. Water to 100 c.c. Water	
	Time	Per Cent	Time	Per Cent	Time minutes	Per Cent
9319.....	1.16	13.5	25	19.1	3	17.6
9320.....	1.0	12.9	29	15.9	2½	16.6
9321.....	1.33	7.8	13	9.9	1½	11.1
9322.....	1.66	12.6	26	15.2	2	16.3
9323.....	1.0	15.3	30	17.9	2½	17.9
9325.....	2.0	15.5	30	18.1	3	19.6

The results, compared with concentrated acid, are shown in Table No. 46. The concentrated acid delints the seed much more quickly and gives lower results. Hence its use is preferable.

Method of Drying.—We here studied the differences found by drying thirty minutes, drying four hours, and allowing to remain exposed to the air over night. The results are in Table No. 47.

TABLE 47.—EFFECT OF METHOD OF DRYING SEED ON AMOUNT OF LINT.

Laboratory Number	Gain in standing over Night	Loss in Drying Four Hours
9317.....	0.85	6.37
9320.....	0.94	5.76
9321.....	0.92	5.62
9322.....	1.05	5.43
9323.....	0.97	5.23
9325.....	1.00	5.23

This is a gain of 0.85 to 1.00 per cent. in exposure over night. This consists of water taken up by the seed and is near the original water content.

It would, of course, be possible to base the method upon water-free seed.

Solution of Hull-Bran.—It is obvious that the solvent action of the sulphuric acid upon the hull-bran is an error in this method.

In order to ascertain the possible magnitude of this error, several experiments were made. In one series of experiments the seed already delinted by acid were subjected to a further treatment with acid, for two minutes in one case, and for four minutes in another. The seed were then dried thirty minutes and then exposed to the air over night. In another experiment, seed carrying little lint were selected, and the lint present was removed, with the exception of a small amount at the tip. The seed were then treated for one minute with concentrated sulphuric acid, dried thirty minutes, and exposed to the air over night. The results are given in Table No. 48.

TABLE 48.—HULL DISSOLVED BY ACID.

Laboratory Number	Delinted by Acid		Delinted by Hand 1 Min.
	4 Min.	2 Min.	
9319.....	3.86	2.68	.....
9320.....	3.05	2.10	.....
9321.....	3.34	3.00	.....
9322.....	3.58	2.29	.....
9323.....	3.36	2.36	.....
9325.....	3.34	3.60	.....
9383.....	.....	.....	2.2
9787.....	.....	.....	2.3
9717.....	.....	.....	2.4
9454.....	.....	.....	2.4
9458.....	.....	.....	2.5
9321.....	.....	.....	2.4

The results show that about 2.5 per cent. hull are dissolved by the acid in one minute. A larger quantity is dissolved during a longer period. We suggest a correction of 2.5 per cent.

METHOD PROPOSED.

The method finally proposed by us is described as follows:

Weigh nearly 10 grams whole cotton seed, record exact weight, place in a dry beaker, add about 15 c.c. of concentrated sulphuric acid, and stir continuously and thoroughly with a glass rod until all of the lint, with the exception of a very little on the tip of the grain, has dissolved. This will take about one minute. Note the time taken. Pour the acid with seed on a perforated plate or porcelain crucible top in a funnel so that the acid will run off quickly. Wash quickly with a quantity of tap water; next, spread on ordinary paper and dry for thirty minutes in the steam oven; then allow to remain exposed to the air over night but protected from mice. Weigh and calculate per cent. and report percentage of "Dissolved lint," giving also time of contact.

Care must be taken to select average seed, which are not broken and which carry no trash; and to allow contact between acid and seed as long as needed.

QUANTITY OF LINT FOUND.

Percentages of dissolved lint on different varieties of seed ginned with a small gin are given in Tables Nos. 38, 39, and 40. The percentages vary more when averaged by variety (Table No. 41) than by locality (Table No. 39). By locality, the averages varied from 11.5 to 13.7 per cent.; by variety from 7.1 to 14.9 per cent. These averages are not corrected by allowing for the amount of hull dissolved, which is about 2.5 per cent. If this correction should be made, the seed would carry 9 to 11.5 per cent. lint, averaged by locality, or 180 to 230 pounds per ton.

TABLE 49.—PERCENTAGE OF DISSOLVED LINT ON SEED, U. S. D. A.

Laboratory Number	U. S. D. A. No.	Per Cent Lint
9413.....	27401H	7.2
9414.....	27403	6.0
9415.....	27405	8.6
9416.....	27407	6.5
9417.....	27409	10.2
9418.....	27411	8.5
9419.....	27413	7.8
9420.....	27415	6.3
9421.....	27417	7.0
9422.....	27419	10.5
9423.....	27421	8.3
9424.....	27423	6.2
9425.....	27425	7.1

Table No. 49 shows the percentage of lint on some of the seed collected by Mr. Bidwell of the U. S. Department of Agriculture, analyses of which are given in Table No. 23. These seed had been reginned and were ready to have the hulls removed. They carry, after a deduction of 2.5 per cent. for dissolved hull, from 3.7 to 7.7 per cent. lint, with an average of 5.4 per cent., or from 74 to 154 pounds, with an average of 112 pounds per ton. At the time these seed were collected, the oil mills were not ginning as closely as they have been doing in 1915-16, and the reginned seed would now carry much smaller percentages of lint.

DIRT WITH COTTON SEED.

During the process of ginning, the dirt and trash are removed separately, but in a number of cases they are mixed with the ginned seed by the ginner. This practice has been prohibited by the Warehouse Law of Texas, passed in 1915. The practice is, however, still followed in other States. The dirt and trash must, of course, be removed before the cotton seed can be passed through the oil mill machinery. The addition of trash or dirt which has been removed during the process of ginning merely involves extra work on the part of the oil mill. It increases the operating cost and decreases the output per ton of seed. This is usually distributed over the entire amount of seed purchased and decreases the price paid for the seed; so that there is no gain to the farmer due to this addition of dirt and trash, but there is really a loss, due to the additional cost of its removal. The

practice of adding dirt and trash should be prohibited by the laws of all States, as has been done in Texas.

ACKNOWLEDGMENT.

Analytical and other work involved in this bulletin has been done by Messrs. Asbury, Rather, Ogier, Hodges, Hudgins, Sprott, Weaver, Roark, Buchwald, Enochs, and others.

SUMMARY AND CONCLUSIONS.

1. Cottonseed meal on the Texas market has, on an average, decreased in feeding value until it has reached the minimum permitted by the Feed Control Service.

2. Cottonseed meal has also decreased in feeding value in other States.

3. The decrease is due to changes in the method of milling and to regulation of the hull content for the purpose of making meal of the desired protein, or protein and fat content.

4. A description of the process of oil milling is given.

5. Chemical control of oil milling has increased the efficiency of oil extraction.

6. It is possible to secure a low oil content of the cake when the crude fiber is 7 to 9 per cent., though, under ordinary conditions, 9 to 11 per cent. appears to lead to a better extraction.

7. Tables are given showing the relation of crude fiber content to the production coefficients of cottonseed meal.

8. Standards for cottonseed meal are 7 per cent. ammonia (equivalent to 36 per cent. protein) in South Carolina, 7.5 per cent. ammonia (equivalent to 38.62 per cent. protein) in North Carolina, Georgia, and Alabama, 38 per cent. protein and not over 11 per cent. crude fiber in Oklahoma, and 51 per cent. protein and fat and not over 11 per cent. crude fiber in Texas.

9. Definitions of cottonseed meal are given.

10. Cottonseed meal may be regulated by its protein content, or protein and crude fiber content.

11. Methods for estimating hulls in cottonseed meal are discussed.

12. Methods for calculating yield of oil and meal from the composition of the seed are discussed.

13. Composition of cotton seed is affected by maturity of seed, locality, variety, and weather conditions.

14. The same variety grown in different localities has a different composition.

15. Different varieties grown in the same locality have a different composition.

16. Oil millers can afford to pay more for seed yielding larger quantities of oil.

17. The composition of the seed is related to the composition of the meal made from it. A method of calculating the original protein content of the seed residue is given.

18. A method for estimating lint on cotton seed is given.

TEXAS AGRICULTURAL EXPERIMENT STATION

BULLETIN NO. 190

JUNE, 1916

DIVISION OF CHEMISTRY

The Effect of Additions on the Availability of Soil Potash, and the Preparation of Sugar Humus



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Chemist in Charge; State Chemist



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THE COMPOSITION OF RICE AND ITS BY-PRODUCTS.

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This bulletin deals with the composition of rice, and particularly with rice by-products. It contains analyses of the various intermediate products secured in milling, together with a discussion of the composition, food, and feeding value of rice and rice by-products.

STATISTICS.

The rice industry in Texas in 1895 occupied about 2000 acres; in 1905 it had grown to about 125,000 acres. In 1915 the Texas industry occupied 260,000 acres. The acreage was 802,600 for the United States in 1915. Texas produced in 1915 over one-fourth of the rice grown in the United States. In 1913, 1914, and 1915, Texas produced over one-third of the United States' rice crop. Rice statistics are shown in Table 1, as given in the Monthly Crop Reporter of the

TABLE 1. RICE STATISTICS FROM MONTHLY CROP REPORTER, DECEMBER, 1915

	1915	1914	1913
Total acreage United States.....	802,600	693,530	827,100
Louisiana acreage.....	401,000	336,500	405,500
Texas acreage.....	260,000	239,700	303,000
Yield, bu. per acre, Louisiana.....	30.5	33.8	32.0
Yield, bu. per acre, Texas.....	34.2	32.1	29.0
Total production, bu., United States.....	28,947,000	23,649,000	25,774,000
Total production, bu., Texas.....	7,930,000	8,102,000	9,696,000
Total production, bu., Louisiana.....	13,714,000	10,802,000	11,760,000

United States Department of Agriculture for December, 1915. It is to be noted that, while the yield per acre in Texas has decreased, the yield in Louisiana has increased during these three years. The year 1914 was a bad rice year.

VARIETIES OF RICE.

The three principal varieties of rice grown in Texas are: Honduras, Japan, and Blue Rose. The Honduras variety of rice has a long slender grain and is more easily broken in milling than the other varieties. It also sells for a somewhat higher price, as its appearance is preferred. The yields are not as large as those of the Japan or the Blue Rose variety.

The Japan variety has a short rounded grain and does not break up so easily in milling as the Honduras variety. It also produces heavier yields per acre.

The Blue Rose variety is intermediate between the Honduras and

the Japan variety. It has a somewhat longer grain than the Japan, although not as long as the Honduras. It does not break up as easily in milling as the Honduras. The Blue Rose variety has only been grown extensively within the last few years, but in 1915 in some localities of Texas, it occupied 80 per cent. of the acreage. Some lots of the Blue Rose variety are much harder and more flinty than the Japan or Honduras variety. Red rice is a wild variety of rice. Its presence is not desired on account of the red color of the outside of the grain, which cannot be entirely removed in milling.

THE MILLING OF RICE.

Rice is covered with a hard, somewhat flinty husk. The grains inside of the husk are generally brown, and the rice with the husk removed is usually termed brown rice. Some grains have a greenish color; such grains are not fully ripe. A greater or less quantity of the greenish grains is present in nearly every lot. Red rice, when present, is shown by the red color of the grain. As the red bran is not entirely removed in milling, the presence of more than a few grains of red rice injures the color of the finished product and decreases its commercial value. The rough rice is also accompanied by trash, weed seed, and other impurities.

The object of rice milling is to remove the impurities, the husk, and also the colored outer epidermis of the rice grain, so as to give the rice the bright color and the more pleasing appearance demanded by the consumer. Milled rice has also better cooking qualities.

Rice is sold in bags which contain approximately 162 pounds of rough rice, and is generally stored in the bags until it is ready to be milled. Different lots are stored separately and milled separately. The following is an outline of rice milling. Practically every mill is different from every other in some respect.

Purifying Rice.—Rough rice, or paddy rice, as it is known, is purified by means of a series of flat vibrating screens, to which air suction is applied by fans. The rice goes through the coarse screens, and the coarser impurities tail over. The weed seed and finer impurities fall through the finer screens and the rough rice tails over. In passing through the air suction space, the light rice and chaff is lifted out of the rough rice and is dropped in a separate compartment. The air then goes through a dust collector, which removes the dust before the air is discharged.

Other machines are also used in cleaning the rough rice, such as a rotating hollow cylinder through which the rice is carried, and through which a blast of air is passed. This has the effect of drying the rice as well as removing the dust. Rice clippers are sometimes used for the purpose of cutting off short particles of straw adhering to the rough rice, so that the rice may be more easily purified on the screens. Rotating cylinders containing indentations or perforations of various sizes are sometimes used for the purpose of lifting impurities such as weed seed out of the rice, or for lifting the rice out of the impurities, as the case may be. These cylinders are similar to those used for the purification of wheat before it is manufactured into flour.

Stones.—The purified paddy rice goes next to the stones. These consist of a pair of grooved stones, somewhat like mill stones, the lower one fixed and the upper one revolving. The motion of the stones whirls the rice on the end and the rotation of the stones grinds off the tips, thereby allowing the rice to escape from the hulls or chaff. In order to avoid breaking the grain, the rice must be touched by the stones as lightly as possible, and the stone must be adjusted for the different kinds of rice. The use of a rice grader to separate rice of different sizes aids in milling without breaking. The first stones only remove the husk of a portion of the rice. The remainder of the paddy rice is separated and removed by another set of stones. The great problem of the rice miller is to remove the husk and the bran without breaking the grain.

Stone Bran Reel.—The mixture of brown rice, paddy rice, and rice hulls from the stones, goes to the stone bran reel, which is a hollow rotating cylinder covered with screen wire, usually 13x13 wire, .028 gauge at the head of the reel; while behind this is a section of chit wire screen, usually 8x8, No. 17 wire. The finer wire takes out finely broken rice, rice germs, and finely broken hulls. This is termed *stone bran*. The material which goes through the chit wire is termed "chits," and consists of a mixture of broken rice and rice hulls. The quantity of rice hulls present depends upon the length of the rotating surface and the speed with which the mixture passes through the reel. The material towards the head of the chit wire may be almost entirely broken rice and towards the end it may be entirely hulls or chaff.

A double screw conveyor with wooden valves at the base of the stone bran reel permits the products which go through the reel to be conveyed as desired. The stone bran is mixed with huller bran; the chits rich in rice go to the huller, while the hulls or by-products rich in hulls go to the hull house. Sometimes the hulls are removed by a subsequent air current.

The object of the stone bran reel is to remove the broken rice and the fine material of feeding value before the mixture goes to the fans. The fans would lift out this light material if it were not previously removed, and it would then pass in with the less valuable hulls or chaff. All rice mills do not use reels for separating the stone bran; some use air currents.

From the stone bran reel, the product goes to the fans. The chaff or hulls go to the conveyor leading to the hull house. In some cases, the hulls go direct to the furnace room.

Paddy Machine.—The mixture of brown rice and paddy rice goes to the paddy machines. These separate the brown rice from the rough or paddy rice. The brown rice goes to the hullers. The rough rice from the paddy machine goes to a separate pair of stones. These can be set somewhat closer than the first pair of stones without danger of breaking so much rice. The product from this pair of stones goes into the stone bran reel with the products from the other stones. The rough rice continues to be separated in the paddy machine until it is finally all milled free of husk.

Hulling.—This term is a misnomer, as it is the *bran* that is removed in this process, not the hulls. The hullers consist of tapering,

grooved cylinders revolving within an iron case, which rub the grains of rice against one another and against the walls of the outer case. The adjustment may be varied, according to the size of the rice. The action of the rice huller is to remove some of the outer coating of the rice or bran, and the germ. Too vigorous action will result in considerable breakage of the rice. The huller blades must be set to suit the variety of rice scoured. The products of the scouring, together with some broken rice, fall through slits $\frac{3}{4}$ inch wide by $\frac{1}{2}$ inch long or $\frac{4}{64}$ inch wide by $\frac{1}{2}$ inch long, in iron plate in the bottom of the huller.

The mixture of broken rice and huller bran is conveyed to a reel, having meshes 14x14, .028 wire. The huller bran is mixed with the stone bran and the product is known as rice bran. The broken rice from the huller bran reel goes to the second huller, or to the cone, if such is used. A small amount of rice bran adheres to the rice coming from the hullers and this may be removed in another reel.

The rice then goes either to the second hullers, or to the pearling cones. In some mills three hullers are used and no cones. In other mills two hullers and no cones are used.

The mixture of broken rice and hulls separated from the other material in the stone bran reel also goes to the hullers for milling. In some mills it is distributed into all the first hullers, or half of the first hullers, and in other cases it is milled in a separate huller. The latter practice is probably the best milling method, as the separate huller can be adjusted more closely to suit the broken rice being milled.

Pearling Cones.—The pearling cones consist of the frustum of a cone covered with a composition stone. This is surrounded by a wire screen, 12x14 or 14x14 mesh. The rice is rubbed between the stone and the wire screen and some of the finely divided product passed through the screen. The thorough rubbing removes a considerable portion of the outer covering of the rice and gives it a better appearance. The cone meal, which is the name given to the by-product of this machine, is sometimes sold separately, and sometimes it is mixed with the polish or sold separately as rice polish. The cone, however, takes the place of the second break huller, and cone meal is properly a portion of the rice bran. It is not rice polish.

Brushes.—The brush is the last scouring machine. It consists of an upright cylindrical frame work covered with hide or skin, and revolving rapidly inside of a covering consisting of a close mesh wire screen, 12x14 mesh of .035 and .041 wire. The rice is rubbed up against the outer screen by means of the rapidly revolving cylindrical frame work, and the thin outer covering of the rice is rubbed off. This is forced through the surrounding screen and is known as rice polish.

Grading.—After passing through these brushes, the rice goes to a reel which removes the brewer's rice. The wire used is usually for one-third of the reel 10 by 10 mesh, the second third 9 by 9 mesh, and the last third 8 by 8 mesh, all of .032 wire. If the rice is not to be coated, it is then passed into the grading machine, which divides it into the several grades of rice, consisting of the entire grain, the second head, and the screenings. The grader usually consists of a number of vibrating screens carrying perforated metal with holes vary-

ing from 11/64 to 11/128 of an inch in diameter. The grades are made according to the kind of rice. The fancy head and second head are usually combined in case of Japan or Blue Rose rice.

If the rice is to be coated, it is passed through a revolving cylinder, into which a small amount of glucose and talc is fed. The cylinder may be heated by steam in cold weather. The object of this coating is to give the rice a high polish. The average quantity of coating material used consists of .20 per cent. glucose and .07 per cent. talc, according to Bulletin No. 330 of the United States Department of Agriculture. The fact that such coating is used must be printed on the label attached to the sack or package when it enters into interstate commerce.

TABLE 2. PRODUCTS FROM RICE MILLING, REPORTED BY VARIOUS MILLS

	Hulls.	Bran.	Polish.	Fancy rice.	Second rice.	Screenings, rice.	Brewers' rice.	Loss and dirt.
Mill 1, 1914.....	36	12	5	52	27	16	10	4
Mill 2, 1914.....	28	19	5	.....	.....	.....	.....	4
Mill 3, 1914.....	31	15	5	.....	.....	.....	.....	9
Mill 4, 1914.....	34	16	6	55	20	15	10	3
Average.....	32	16	5	53	24	16	10	5
Japan, 1914.....	32	12	3	93	.....	12	5	5
Japan, 1914.....	27	19	6	100	.....	7	5	.....
Japan, 1914.....	30	14	4	90	.....	15	4	5
Japan, 1915.....	11	4	4	98	0	5	6	.....
Japan, 1915.....	28	12	3	96	.....	12	6	5
Japan, 1915.....	.....	15	5	98	0	6	5	.....
Japan, 1915.....	.....	14	4	96	.....	10	4	3
Japan, 1915.....	28	14	5	80	5	5	4	.....
Japan, 1915.....	.....	14	5	98	.....	.....	4	.....
Japan, 1915.....	.....	13	6	98	.....	6	4	.....
Average.....	29	14	5	95	5	9	5	5
Honduras, 1914.....	40	15	4	54	22	15	7	5
Honduras, 1914.....	27	19	6	60	10	26	6	.....
Honduras, 1915.....	35	15	5	56	18	20	8	5
Honduras, 1915.....	.....	15	5	64	13	16	8	.....
Honduras, 1915.....	.....	12	4	65	23	10	8	.....
Honduras, 1915.....	30	16	6	65	28	20	7	3
Honduras, 1915.....	.....	15	5	60	.....	.....	7	.....
Honduras, 1915.....	.....	14	3	60	9	30	5	5
Honduras, 1915.....	36	16	5	60	25	15	4	.....
Honduras, 1915.....	.....	14	6	60	20	12	10	.....
Average.....	34	15	5	60	19	18	7	5
Blue Rose, 1915.....	.....	15	5	88	.....	12	5	.....
Blue Rose, 1915.....	28	14	5	95	6	4	3	.....
Blue Rose, 1915.....	.....	12	5	93	0	4	4	.....
Blue Rose, 1915.....	30	13	3	95	4	8	4	5
Blue Rose, 1915.....	.....	15	4	97	0	10	3	.....
Blue Rose, 1915.....	.....	10	4	94	0	8	5	.....
Blue Rose, 1915.....	.....	11	4	86	0	17	7	.....
Average.....	29	13	4	93	5	9	4	5
Honduras, Bul. 330, U. S. D. A.....	33	22	6	59	19	15	8	.....
Japan, Bul. 330, U. S. D. A.....	30	20	6	96	.....	5	5	.....
(Honduras) Texas Bul. 73.....	32	20	6	62	23	10	5	3.4
	32	21	6	72	21	10	6	3.4

QUANTITY OF OUTPUT.

The quantity of output depends upon the method of milling and also upon the quality of rice. Some lots of rice break up to a much greater extent than others. The quantity of the different grades of cleaned rice is therefore very variable. Table No. 2 shows the average quan-

tity of the different by-products as reported to the writer by a number of rice millers during the years given. The table also gives the yield as given in Bulletin No. 330 of the United States Department of Agriculture. It is noted that there is considerable difference in the quantity of rice bran reported.

THE COMPOSITION OF RICE AT THE DIFFERENT STAGES OF MILLING.

The samples analyzed were collected from a number of Texas mills at various times. Table No. 3 shows the average composition of rice

TABLE 3. AVERAGE COMPOSITION OF RICE AT DIFFERENT STAGES OF MILLING.

	Number Averaged.	Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.	Pentosana.
Rough rice (Paddy).....	9	8.09	1.80	8.89	64.52	11.68	5.02	.....
Brown rice (from stones).....	16	9.13	2.00	1.08	74.53	12.16	1.10	2.12
Rice from huller.....	11	8.75	.93	.56	78.41	12.66	.69	1.91
Rice from second break huller.....	3	9.10	.77	.52	78.80	12.23	.09	1.65
Rice from pearling cone.....	7	8.86	.58	.47	78.78	12.81	.50	1.78
Rice from brushes.....	5	8.98	.46	.35	78.98	12.37	.10	1.76
Head rice.....	8	9.01	.50	.40	77.02	12.57	.50	1.75
Second head rice.....	9	8.71	.43	.43	77.37	12.41	.65	1.88
Screenings rice.....	8	8.35	.54	.41	78.68	11.39	.63	1.75
Brewers' rice.....	9	8.88	.95	.56	77.14	11.78	.79	1.71
Honduras rough rice (U. S. D. A.).....	4	7.48	1.58	8.67	.....	11.27	5.40	6.90
Japan rough rice (U. S. D. A.).....	3	6.50	1.74	7.93	.....	11.05	5.14	5.48
Honduras brown rice (U. S. D. A.).....	4	8.57	1.79	.99	.....	12.32	1.18	2.42
Japan brown rice (U. S. D. A.).....	3	7.24	1.52	.85	.....	12.38	1.13	2.28
Honduras rice from huller (U. S. D. A.).....	4	7.79	.40	.39	.....	12.56	.53	1.90
Japan rice from huller (U. S. D. A.).....	3	6.82	.66	.42	.....	13.70	.70	1.76
Honduras rice from cones (U. S. D. A.).....	4	7.88	.28	.30	.....	12.50	.47	1.53
Japan rice from cones (U. S. D. A.).....	3	6.59	.31	.29	.....	13.38	.40	1.60
Honduras rice from brushes (U. S. D. A.).....	4	8.06	.25	.30	.....	11.89	.36	1.80
Japan rice from brushes (U. S. D. A.).....	3	6.61	.22	.29	.....	12.82	.32	1.68
Honduras rice from trumbles (U. S. D. A.).....	4	7.75	.21	.26	.....	12.02	.40	1.66
Japan rice from trumbles (U. S. D. A.).....	3	6.47	.19	.29	.....	12.50	.34	1.68
Rough rice (Louisiana).....	.....	7.44	2.58	9.28	.....	10.95	5.45	.....
From hulling stones.....	.....	8.09	2.10	3.03	.....	12.12	2.55	.....
Pounded.....	.....	8.14	2.50	2.55	.....	12.42	2.38	.....
From cooling floor.....	.....	7.74	1.05	.72	.....	12.75	.82	.....
Clean.....	.....	7.52	.38	.47	.....	12.85	.73	.....

at different stages of milling as averaged from Table No. 4, which contains the individual analyses of the different series. Table No. 3 also contains the average of three series of Japan rice and four series of Honduras rice given in Bulletin No. 330 of the United States Department of Agriculture; it also contains, as published in Bulletin 24, 1889, of the Louisiana Experiment Station, the average of one series of Louisiana rice, Honduras type, milled in the old-fashioned mortar and pestle mill. The by-products of the mortar and pestle mill would contain considerable rice hulls, since they are not completely removed by the stones.

The hulls are rich in crude fiber and ash. The effect of the removal of the hulls from the rough rice is to decrease the ash and crude fiber of the rice markedly and to increase the percentages of the other constituents. A large portion of the ether extract and of the crude fiber is removed from the brown rice, as it is called, by the huller. The quantities removed by the other machinery is much smaller. The process of milling thus involves a decrease of ether extract, fiber, and ash. The removal of the ether extract undoubtedly increases the keeping qualities of the rice, rendering it less liable to become rancid. This is perhaps more clearly shown by comparing the composition of the rice bran and rice polish with that of the clean rice.

TABLE 4. ROUGH RICE OR PADDY RICE.

Laboratory No.	Variety.	Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.	Insoluble ash.
9587	Honduras.....	7.39	1.81	8.69	64.45	12.62	5.04	.....
9600	Honduras.....	8.35	1.40	10.10	60.95	13.59	5.61	4.24
9821	Honduras.....	8.79	2.07	8.24	65.80	10.71	4.39	.....
9843	Honduras.....	8.69	1.39	9.52	63.86	11.18	5.36	.....
9900	Honduras.....	8.95	1.64	9.51	62.90	12.18	4.82	.....
9620	Blue Rose.....	8.11	1.96	8.31	66.04	11.28	4.30	.....
9853	Blue Rose.....	7.23	1.99	9.14	65.53	11.25	4.66	.....
9882	Japan.....	7.44	2.05	6.99	66.41	12.71	4.40	.....
9645	Red, largely.....	7.85	1.89	9.48	64.72	9.64	6.42	.....
Average.....		8.09	1.80	8.89	64.52	11.68	5.02	.....

TABLE 4. (Continued.) BROWN RICE (FROM STONES).

Laboratory No.	Variety.	Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.	Insoluble ash.
9591	Honduras.....	8.38	2.20	1.04	73.78	13.52	1.08	.15
9604	Honduras.....	9.69	1.85	1.14	71.64	14.14	1.54	.....
9478	Honduras.....	10.43	1.69	1.05	71.39	14.41	1.03	.12
9487	Honduras.....	9.15	1.88	.96	75.67	11.39	.95	.05
9926	Honduras.....	9.21	1.84	.99	74.52	12.26	1.18	.....
9817	Honduras.....	9.55	1.41	1.07	75.30	11.70	.97	.....
9832	Honduras.....	9.38	2.30	1.11	74.35	11.88	.98	.15
9898	Honduras.....	10.65	2.04	1.20	73.13	11.85	1.13	.20
11206	Honduras.....	8.56	1.88	0.97	76.74	10.87	0.98	0.13
9621	Blue Rose.....	9.61	2.01	1.05	74.28	12.08	.97	.....
9854	Blue Rose.....	7.90	2.19	.97	75.90	12.04	1.00	.....
11198	Blue Rose.....	8.56	2.33	1.51	75.89	10.55	1.16	0.28
9890	Japan.....	7.96	1.73	.78	75.72	12.78	1.03	0.18
9918	Japan.....	8.22	1.91	.95	75.72	12.11	1.09	.16
9638	Red, largely.....	9.43	2.56	1.43	74.39	10.79	1.40	.24
9917	Red, largely.....	9.32	2.14	1.06	74.21	12.14	1.13	.15
Average.....		9.13	2.00	1.08	74.53	12.16	1.10	.1

TABLE 4. (Continued.) RICE FROM HULLER.

Laboratory No.	Variety.	Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.	Insoluble ash.
9597	Honduras.....	7.55	.78	.63	78.60	11.85	.59	.03
9609	Honduras.....	9.19	.34	.46	74.86	14.51	.64	.....
9480	Honduras.....	9.70	.61	.47	74.12	14.63	.47	.10
9829	Honduras.....	9.44	.94	.62	75.17	13.22	.61	.....
9847	Honduras.....	10.44	.85	.62	74.98	12.59	.52	.....
9901	Honduras.....	10.19	1.10	.53	73.81	13.18	1.19	.....
9616	Blue Rose.....	8.45	1.36	.71	77.09	11.58	.80	.....
9855	Blue Rose.....	7.60	1.58	.65	77.28	12.12	.77	.10
9919	Blue Rose.....	6.80	.75	.28	79.62	11.99	.56	.08
9885	Japan.....	7.75	.88	.58	77.26	12.81	.72	.15
9639	Red.....	9.09	1.09	.58	77.79	10.73	.72	.....
	Average.....	8.75	.93	.56	76.41	12.66	.69	.09

TABLE 4. (Continued.) RICE FROM SECOND BREAK HULLER.

Laboratory No.	Variety.	Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.	Insoluble ash.
9589	Honduras.....	7.81	.66	.44	77.51	13.07	.51	.01
9895	Honduras.....	10.23	.82	.62	75.32	12.41	.60	.....
9619	Blue Rose.....	9.25	.83	.51	77.58	11.20	.63	.16
	Average.....	9.10	.77	.52	76.80	12.23	.58	.09
	Rice From Pearling Cone. Variety.							
9588	Honduras.....	7.69	.65	.40	78.02	12.74	.50	.04
9485	Honduras.....	10.00	.40	.39	75.19	13.68	.34	.....
9825	Honduras.....	9.49	.69	.42	76.14	12.71	.55	.16
9840	Honduras.....	9.66	.53	.37	76.96	12.13	.35	.....
9905	Honduras.....	10.24	.47	.49	75.86	12.39	.55	.....
9856	Blue Rose.....	7.00	.70	.58	78.27	12.89	.60	.14
9875	Japan.....	7.93	.61	.41	77.29	13.13	.63	.16
	Average.....	8.86	.58	.47	76.78	12.81	.50	.13
	Rice From Brushes. Variety.							
9482	Honduras.....	9.69	.16	.52	75.23	14.12	.28	.06
9838	Honduras.....	10.25	.78	.29	76.19	12.05	.44	.....
9897	Honduras.....	9.95	.51	.27	75.97	12.96	.34	.....
9863	Blue Rose.....	7.26	.40	.36	79.16	12.50	.32	.06
9881	Japan.....	7.75	.45	.32	77.72	13.28	.48	.18
	Average.....	8.98	.46	.35	76.86	12.98	.37	.10

TABLE 4. (Continued.) HEAD RICE OR FANCY RICE.

Laboratory No.	Variety.	Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.	Insoluble ash.
9598	Honduras.....	9.44	.78	.40	76.07	12.37	.94	.....
9486	Honduras.....	9.97	.25	.39	75.11	13.84	.44	.13
9824	Honduras.....	8.94	.27	.35	77.00	13.14	.30	.....
9833	Honduras.....	10.04	.98	.35	76.26	12.00	.37	.....
9892	Honduras.....	9.92	.33	.38	76.56	12.00	.78	.....
9622	Blue Rose.....	8.68	.48	.44	78.12	11.91	.36	.....
9864	Blue Rose.....	6.60	.39	.43	79.85	12.28	.45	.08
9879	Japan.....	8.50	.50	.48	77.18	12.98	.36	.06
	Average.....	9.01	.50	.40	77.02	12.57	.50	.09
	Second Head Rice. Variety.							
9596	Honduras.....	8.40	.30	.45	77.48	13.08	.29	.04
9607	Honduras.....	9.20	.39	.37	75.95	12.69	1.40	.....
9481	Honduras.....	9.25	.44	.43	75.22	14.14	.52	.16
9830	Honduras.....	9.00	.56	.37	76.56	12.91	.60	.....
9848	Honduras.....	9.64	.43	.60	76.65	12.24	.44	.....
9894	Honduras.....	9.69	.19	.53	76.65	11.87	1.07	.....
9624	Blue Rose.....	8.51	.41	.39	78.74	11.54	.41	.....
9862	Blue Rose.....	6.56	.58	.39	80.09	12.07	.31	.05
9647	Red.....	8.14	.58	.37	78.92	11.15	.84	.....
	Average.....	8.71	.43	.43	77.37	12.41	.65	.08

TABLE 4. (Continued.) CLEANED RICE SCREENINGS.

Laboratory No.	Variety.	Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.	Insoluble ash.
9594	Honduras.....	8.56	.40	.42	77.51	12.78	.33	.02
9603	Honduras.....	8.69	.81	.48	76.75	12.08	1.19	.....
9822	Honduras.....	9.00	.44	.53	82.46	7.05	.52	.06
9891	Honduras.....	8.73	.55	.29	77.99	11.73	.71	.....
9623	Blue Rose.....	8.81	.49	.36	78.14	11.78	.42	.....
9861	Blue Rose.....	6.77	.58	.65	79.43	12.12	.40	.05
9877	Japan.....	7.75	.48	.28	78.68	12.37	.44	.03
9643	Red.....	8.45	.59	.30	78.45	11.21	1.00	.....
	Average.....	8.35	.54	.41	78.68	11.39	.63	.04
	Brewers' Rice. Variety.							
9592	Honduras.....	8.51	.31	.59	77.36	12.85	.38	.11
9599	Honduras.....	8.87	.92	.47	76.29	12.88	.57	.....
9475	Honduras.....	9.43	.66	.57	74.84	14.05	.45	.....
9816	Honduras.....	9.85	.82	.68	76.15	11.73	.77	.....
9842	Honduras.....	9.79	.63	.42	81.61	6.85	.70	.....
9893	Honduras.....	8.75	.43	.55	77.84	11.76	.67	.18
9612	Honduras Blue Rose.....	8.48	.87	.50	77.24	12.02	.89	.....
9849	Blue Rose.....	7.59	1.79	.73	77.23	11.95	.71	.10
9876	Japan.....	8.62	2.08	.57	75.73	11.89	1.11	.....
	Average.....	8.88	.95	.56	77.14	11.78	.69	.13

Table No. 5 shows the average phosphoric acid and potash content, and other constituents of the rice as it occurs from various stages of the milling process. The number averaged is variable, and may be

TABLE 5. AVERAGE COMPOSITION OF RICE AT DIFFERENT STAGES OF MILLING.

	Phosphoric acid.	Polish.	Insoluble ash.	Lime.	Magnesium.	Reducing sugar.	Di. Sugars.	Pentosans.
Rough rice (Paddy).....	.54	.25	.....	.....	.....	.....	.....	.....
Bran rice (from stones).....	.63	.25	.16	.09	.14	.12	.79	2.12
Rice from huller.....	.40	.13	.09	.04	.07	.11	.48	1.91
Rice from second break huller.....	.36	.05	.09	.04	.09	.03	.14	1.65
Rice from pearling cone.....	.29	.14	.13	.05	.05	.11	.16	1.78
Rice from brushes.....	.25	.13	.10	.02	.06	.09	.24	1.76
Head rice.....	.23	.07	.09	.04	.06	.14	.17	1.75
Second head rice.....	.27	.09	.08	.05	.08	.10	.23	1.86
Screenings rice.....	.26	.05	.04	.04	.05	.05	.30	1.75
Brewers' rice.....	.32	.16	.13	.04	.09	.17	.24	1.71

found by referring to the detailed Table No. 6. Decided changes in some of these constituents are also noticed, especially in the phosphoric acid content of the brown rice and the clean rice. There is twice as much phosphoric acid in the brown rice as there is in the clean rice. The other mineral constituents, the pentosans, and the sugars, also decrease. Rice contains only small quantities of sugars. This is also reflected in the composition of the by-products as given on another page of this bulletin.

TABLE 6. ROUGH RICE.

Lab. No.	Silica.	Lime.	Magne- sia.	Potash.	Phos- phoric acid.
9587.....26	.59
9620.....25	.52
9600.....	4.24	.08	.21	.24	.54
9645.....25	.69
9821.....47
9853.....15	.53
9843.....21	.45
9900.....27	.59
9882.....37	.52
Average.....	4.24	.08	.21	.25	.54

TABLE 6—Continued.

Laboratory No.	Line.	Magnesium.	Potash.	Phosphoric acid.	Pentosans.	R. Sugar.	Di. Sugar.
Rice From Stones.							
9501	.09	.20	.24	.64	2.46	.05	.85
9621			.24		1.95		
9604			.21	.76	2.26		
9638	.12	.04	.26	.81	2.23		
9478	.05	.11	.20	.67	2.31	.33	.51
9487			.26	.75	1.58	.14	
9926			.38	.80	2.15		
9617				.48	2.23		
9654				.56	2.03		
9632	.08	.16	.23	.49	2.22		
9696				.56			
9690	.10	.20		.55		.06	.89
9917				.55	1.93	.03	.74
9918				.57	2.14	.12	.96
Average	.09	.14	.25	.63	2.12	.12	.79
Rice From First Huller.							
9597	.09	.12	.19	.44	1.62	.05	.46
9616				.43	2.23		
9609			.08	.36	1.73		
9639				.50	2.20		
9480	.05	.13	.15	.50	1.67	.24	.37
9629				.31			
9655	.01	.01	.05	.41	2.11		
9647			.18	.28			
9901				.41		.11	
9685	.06	.04		.41	2.06	.11	
9919	0	.03		.35	1.64	.03	.62
Average	.04	.07	.13	.40	1.91	.11	.48
Rice From Second Huller.							
9589	.06	.11	.11	.36	1.61	.03	.14
9619	.02	.07			1.68		
Average	.04	.09	.11	.36	1.65	.03	.14
Rice From Cones.							
9588	.05	.05	.13	.28	1.79	.03	.01
9485			.24	.32	1.87	.18	.30
9625	.08	.03	.12	.27	1.85		
9656	.01	.05		.28	1.85		
9640			.08	.23			
9905			.13	.33			
9675	.01	.05		.30	1.73		
Average	.04	.05	.14	.29	1.82	.11	.16
Rice From Brushes.							
9482	.04	.08	.20	.29	1.74	.14	.27
9640				.33	1.73		
9638			.06	.20			
9697	.01	.03		.24	1.67		
9663	.01	.06		.21	1.91	.03	.21
9681				.22			
Average	.02	.06	.13	.25	1.76	.09	.24
Fancy Head Rice.							
9595	.08	.04	.06	.25	1.61	.04	.05
9622			.23	1.62			
9598			.08	.26	1.91		
9486	.07	.10	.08	.27	1.61	.24	.29
9624				.20	2.00		
9664	.01	.07		.19	1.82		
9633			.07	.19			
9679	.01	.02			1.70		
Average	.04	.06	.07	.23	1.75	.14	.17

TABLE NO. 6—Continued.

Laboratory No.		Lime.	Magnesium.	Potash.	Phosphoric acid.	Pentosans.	R. Sugar.	Di. Sugar.
	Head Rice.							
9596	.....	.08	.08	.14	.31	1.74	.01	.18
9624	.....				.35	1.94		
9647	.....	.04	0		.34	1.79		
9607	.....			.08	.35	1.82		
9481	.....	.04	.08	.05	.29	1.89	.18	.27
9830	.....				.28	1.97		
9848	.....			.10	.20			
9894	.....				.31			
9862	.....	.03	0		.20			
	Average.....	.05	.08	.09	.27	1.86	.10	.23
	Screenings Rice.							
9594	.....	.06	.06	.02	.28	1.58	.05	.30
9623	.....				.25	1.76		
9603	.....			.07	.37	1.85		
9643	.....				.33	1.91		
9822	.....	0	.02		.20	1.64		
9891	.....	.02	.09		.19			
9861	.....	.04	.03		.20			
9877	.....	.03			.24			
	Average.....	.04	.05	.05	.26	1.75	.05	.30
	Brewers' Rice.							
9592	.....	.07	.07	.12	.30	1.70	.04	.24
9612	.....				.32	1.79		
9599	.....			.12	.31	1.73		
9475	.....			.14	.34	1.62	.30	.23
9816	.....				.32			
9849	.....	.02	.11	.19	.37			
9842	.....			.24	.26			
9893	.....	.03	.08		.37			
	Average.....	.04	.09	.16	.32	1.71	.17	.24

FOOD VALUE OF RICE.

A food furnishes an animal with *protein*, which is used for the building of flesh or muscle, or similar tissue, or for repairs to such tissue as is worn out by the life activities of the animal; and *energy* which is used for the purpose of furnishing heat, of furnishing energy to do work, to carry on the activities of the body, such as the beating of the heart, and movement of the lungs, or which is stored up as fat or used in the manufacture of meat, milk, or other products. Food is used by men for similar purposes.

In addition to the food value, so far as it fulfills the above uses, we have to consider with man the palatability of the food and its appeal to the senses or to the appetite. There are in addition substances in food which have effects quite out of proportion to their feeding value, and these must also be taken into consideration when one is choosing a food.

The value of a food for the repair or production of tissue may be expressed in its content of digestible protein. Its value for the pro-

duction of heat, fat, or energy, may be expressed in terms of energy as calories.

Table No. 7 contains a comparison of the protein and energy values of rice and some other foods. The results are expressed in terms of the weight as purchased. In the preparation of food for human con-

TABLE 7. COMPARATIVE COMPOSITION OF RICE AND OTHER FOODS.

	Protein Per cent.	Calories Per pound.
Rice.....	8.0	1630
Oat meal.....	16.1	1860
Wheat flour.....	13.1	1665
Corn meal.....	9.2	1655
Cheese, American.....	28.8	2055
Potatoes, Irish (as purchased).....	1.8	310
Potatoes, sweet (as purchased).....	1.4	460
Peanuts, edible part.....	25.8	2560
Cabbage, as purchased.....	1.4	125

sumption, a certain loss is unavoidable, due to unedible parts. This portion is practically nothing in the case of rice, but in the case of some other foods, it is a high proportion of the weight of the food. The table contains the total content of protein and of energy furnished by the different foods. The digestible part should be considered as well as the total, but there is comparatively little difference in the digestibility of rice and the foods mentioned.

The table shows that rice has a high food value. Fancy head rice, though selling for a higher price, has no greater food value than the second grade rice. Rice screenings have a high food value, practically the same as head rice, and thus are a much cheaper human food. Brewer's rice also has a high food value and could likewise be used as a human food. Table No. 8 shows the quantity of calories or of pro-

TABLE 8. COMPARATIVE VALUES OF RICE AND OTHER FOODS.

	Price, cents per pound.	Quantity for ten cents.	
		Calories.	Protein, ounces.
Oat flakes.....	10	1850	2.67
Corn meal.....	7	3972	3.52
Wheat flour.....	5	3300	3.64
Potatoes, Irish, \$1.00 a bushel.....	5	1890	1.74
Rice, cheaper grades.....	5	3250	2.56
Rice, fancy head.....	8	2025	1.60
Macaroni.....	10	1665	2.14

tein that may be purchased in rice and other foods, at the prices given. Rice compares very favorably in food value with these other foods at the prices given. There is no reason why the lower grades of rice should not be used for human food in this country, as they are used elsewhere.

According to D. D. Van Slyke (*Journal of Biological Chemistry*, 22, 259), the protein or flesh-forming constituent of rice, in its general make up, more nearly resembles the proteins of the animal body, than do the proteins of corn or wheat. This, he says, may explain the

extensive use of rice as an almost exclusive diet, in spite of its low protein content. In other words, the protein of rice may be better suited to the building or repair of tissue in the human body, than is the protein of corn or wheat.

Vitamines.

When polished rice forms a large proportion of the diet, or almost all of it, as is sometimes the case in China or Japan, a disease occurs which can usually be cured by substituting unpolished rice for the polished rice and may be entirely avoided by using the unpolished rice. This disease may also be cured by means of an extract of rice bran or rice polish. The disease is evidently due to the absence of some constituent of the rice removed during the process of polishing. There are other diseases which occur under similar conditions, and which may be prevented or rectified by proper changes in diet. It has been claimed that the trouble experienced in using polished rice referred to above is due to the removal of phosphoric acid during the process of polishing, but the addition of inorganic phosphates to the diet did not effect a cure (Chamberlain, *Philippine Journal of Science*, 1911, page 177). It is certain that considerable quantities of phosphoric acid are removed during the process of polishing rice.

The later theories ascribe the disease to the removal of substances termed *vitamines* from the rice (Frank, *Journal of Physiology*, 46, 172, 1913). According to this theory, some plants or foods contain substances which, in small amounts, are essential to the proper performance of the functions of the body, and when these substances are not eaten in sufficient quantity, disturbances of health follow. The vitamins are organic compounds somewhat unstable in character, and there are several different groups, the absence of which give rise to different symptoms. Three diseases that have been ascribed to the absence of the corresponding vitamins are beri-beri, scurvy, and pellagra. Beri-beri occurs among races consuming polished rice as a large proportion of their diet, and may be prevented or usually cured by the substitution of unpolished rice for the polished rice. The vitamins corresponding are supposed to be present not only in unpolished rice, but also in yeast (which is very rich in vitamins), milk, egg yolk, fresh meat, fish, beans, peas, oats, barley, wheat, and corn. These foods are named in order, beginning with those richest in vitamins. Highly milled cereals, starch, pork, sterilized milk or meat, cabbage, and turnips are all poor in vitamins. (See Voegtlin, *Scientific Monthly*, 2, page 289.)

Pellagra is a disease which has been ascribed to a number of sources, including mouldy corn meal and the buffalo gnat. The latest theory ascribes it to deficient nutrition and probably to the absence of proper vitamins. Possibly where corn meal has been used as a food it has been so highly milled as to remove the vitamins, or cooked with soda, which destroys the vitamins. Although a person living on a varied diet is likely to secure a sufficient quantity of the proper vitamins, at least to maintain fairly good health, yet it is possible that minor disturbances of health or failure to reach the maximum of good health may

be due to the absence of the proper vitamins in sufficient amount. Further, an improper diet will furnish insufficient vitamins and cause disturbances of health.

POLISHED RICE VERSUS BROWN RICE.

Brown rice is the rice as it comes from the stones, before the bran has been removed. It is usually brown in color, with some grains of a greenish tinge, which are rice grains not completely ripe. When brown rice is sold as such, the lot is carefully selected so that it will not contain any greenish grains. These grains are not objectionable except that the color does not appeal to the eye. Brown rice is more easily attacked by the weevil than polished rice, and must, therefore, be stored more carefully. It takes longer to cook, and has a different taste from that of polished rice.

Brown rice contains the vitamins necessary for the animal body, which are removed in the preparation of polished rice. When the diet contains sufficient milk, meat, and fresh vegetables to supply the deficiency, no trouble is experienced, but where the diet consists largely of rice, brown rice is preferable. According to Worth and Darabsett (*Experiment Station Record*, 31, 163), from the Burmese native standpoint, "the more perfect the polish, the better does the rice cook, and, therefore, the preference for highly polished rice is not merely due to its clean white appearance, but to the good cooking qualities indicated by its appearance. It is doubtful whether we have as much reason for preferring white bread as the rice-eater has for preferring well-polished rice. The question of cooking quality in relation to extent of polishing is one that deserves some study by the millers. It may be just as possible to produce a good cooking rice without polishing quite so much as is the custom. A chemical test bearing on the cooking quality may be mentioned here. By means of dilute alkali, rice grains can be disintegrated and eventually gelatinized, but this does not take place at all until the outer layers of the grain have been gelatinized."

The above discussion shows that there are excellent reasons for advocating the use of brown rice as a human food. It also shows that the purchaser of polished rice has other reasons for his choice in addition to the clean white color.

RICE BY-PRODUCTS.

The most important of rice by-products are rice bran and rice polish. Rice bran is a mixture of the by-products from several machines, the stone bran, cone bran, and huller bran. In addition to the rice bran and rice polish, there is also the so-called "Chicken Feed," which consists of the screenings from rough rice. There are also hulls, light rice, dust from several dust collectors, and some intermediate products, such as chits. A comparison of the various by-products is given in Table No. 10.

Chicken Feed (Rough Rice Screenings).

The chicken feed consists of broken rice, weed seeds, mud balls, sand, and other material which passes through the screens in the preliminary cleaning of rough rice. It is really rough rice screenings. When any considerable proportion of broken rice (thresher broken rice, it is called) is present, the broken rice is separated as far as possible. The presence of certain weed seeds, however, renders the separation of the thresher broken rice from some rices, a matter of difficulty.

As its name indicates, the "chicken feed" is usually sold locally as a chicken feed. The quantity, as a rule, is small, usually less than 1 per cent., though in some lots of rice it may run to 6 or 7 per cent.

The composition of "chicken feed" will naturally vary considerably, according to the kind and character of the mixture. Table No. 9 contains analyses of several samples of chicken feed. There is a decided variation in the composition. The ash content varies from 2.89 to 33.36. The high ash is due to the presence of sand or mud balls. On account of the presence of sand and dirt, this product is not usually well suited to mix with other feeds for cattle feeding. The ether extract varies from 1.53 to 7.49. The high ether extract is due to weed seeds rich in oil. The crude fiber varies from 2.67 to 12.55.

Table No. 9 also contains an analysis of the seed of a weed found with rice in the Beaumont section, termed "Mexican weed." This seed consists of small black seed about the size of a radish seed. It contains

TABLE 9. "CHICKEN FEED" (ROUGH RICE SCREENINGS).

Laboratory No.		Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.	Insoluble ash.
9819	Honduras	7.72	1.61	2.67	46.17	8.47	33.36	29.09
9851	Blue Rose	13.64	7.49	12.55	49.65	9.91	6.76	3.98
9841	Honduras	9.69	2.40	3.25	57.25	10.25	17.16	15.46
9906	Honduras	9.24	3.43	8.90	63.37	12.17	2.89	
9878	Japan	7.91	1.53	5.37	48.96	9.43	26.77	26.28
11214	Chicken feed	9.75	2.76	5.61	57.56	10.76	13.56	10.85
11217	Chicken feed	8.88	1.95	3.47	57.63	10.88	17.19	13.90
	Average	9.55	3.02	5.97	54.38	10.27	16.81	16.59
	Mexican weed seed	16.78	30.90	35.16	6.76	7.06	3.34	

a high fat content. An oil is prepared from a seed similar to this, which is grown in Russia, and the oil is used in the lamps kept burning before the sacred images, or ikons.

Chicken feed has sometimes been ground and added to rice bran. Such an addition to rice bran must be considered as an adulteration, unless the fact of the addition is stated.

Stone Bran.

Stone bran is sifted out of the mixture of hulls and brown rice, coming from the stones which remove the hulls from the rough rice.

For this reason it is called stone bran. The mesh is usually 13x13, .028 gauge, tinned wire. Some mills use 14x14, .028 gauge. The quality of the stone bran depends upon the length of the reel and the rate at which the material passed through it. Towards the end of the wire, the material which comes through may consist almost entirely of rice hulls. Wooden valves, and two conveyors permit the product to be taken either to the bran mixer or to the hull house. The quantity of hulls in the stone bran may thus, to a certain extent, be regulated by the miller.

The stone bran consists of finely broken rice hulls, some rice bran, some of the germ broken from the end of the rice, dirt from mud balls, or that which adheres to the outside of the rough rice, and sometimes a little finely broken rice.

TABLE 10. COMPARATIVE AVERAGE COMPOSITION OF RICE BY-PRODUCTS.

	Number averaged.	Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.	Insoluble ash.
Chicken feed (rough rice screenings).	7	9.55	3.02	5.97	54.38	10.27	16.81	.....
Mexican weed seed.	1	16.78	30.90	35.16	6.76	7.06	3.34	.....
Honduras stone bran.	8	9.61	6.26	19.69	39.91	10.23	14.30	11.25
Japan stone bran.	2	11.47	10.32	17.48	37.20	9.55	15.00	9.71
Blue Rose stone bran.	12	9.60	8.16	22.33	34.49	9.35	16.07	12.93
All stone bran.	22	9.77	7.66	20.92	36.73	9.69	15.23	12.06
Honduras huller bran.	9	14.92	15.01	6.72	45.58	10.37	7.41	1.26
Japan huller bran.	4	14.28	16.40	9.12	43.55	9.11	7.53	1.40
Blue Rose huller bran.	10	15.29	18.78	8.47	38.13	9.65	7.38	1.55
Pearling cone bran.	8	15.39	15.97	5.66	46.13	9.77	7.08	.92
Mixed bran.	18	13.63	14.78	11.69	40.14	9.78	9.98	4.50
Rice hulls.	14	3.56	.93	39.05	29.38	8.49	18.59	17.52
Rice polish.	10	12.88	9.07	2.12	61.81	9.91	4.21	.....
Dust, various.	9	6.36	3.62	23.54	30.75	8.09	27.63	.....

The composition of stone bran is shown in Table No. 10, and details in Table No. 11. The crude fiber content varies from 18.09 to 25.94 per cent., with an average of 19.15. The high crude fiber content is due to the presence of rice hulls.

The ether extract of the stone bran varies from 4.28 to 10.90, with an average of 7.33. This content of ether extract, taken in connection with the protein content, shows the presence of the germ and bran layers similar to those removed by the huller.

Stone bran from Blue Rose rice contains, on an average, more fat and more crude fiber than the average stone bran from Honduras rice.

The stone bran is not rice bran, but a mixture of rice bran and rice hulls secured in the milling of rice. In a strict sense, a mixture of stone bran and rice bran should not be sold as rice bran. On the other hand, the stone bran may be regarded as containing some rice bran mixed with an unavoidable amount of rice hulls. From this viewpoint the sale of stone bran mixed with huller bran and cone bran, under the name of rice bran, may be permitted. The fact must fur-

TABLE 11. STONE BRAN (SO-CALLED).

Laboratory No.		Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.	Insoluble ash.	Hulls.
9598	Honduras Rice.....	10.85	6.97	14.09	47.97	10.38	9.74	6.63	19.6
9602	Honduras Rice.....	9.13	4.28	19.81	39.21	10.84	16.73	14.36	38.1
9476	Honduras Rice.....	10.29	6.84	19.81	38.87	11.61	12.58	10.33	38.1
9823	Honduras Rice.....	9.33	6.07	23.87	37.21	9.29	14.23	11.51	51.2
9846	Honduras Rice.....	8.68	5.24	25.74	35.70	8.68	15.06	13.59	57.2
9907	Honduras Rice.....	8.19	6.46	22.32	38.75	9.04	15.24	12.55	46.2
11179	Honduras Rice.....	9.94	6.73	16.50	39.88	10.38	17.02	12.32	26.0
11192	Honduras Rice.....	10.50	7.48	15.83	41.66	11.64	12.89	9.67	25.3
	Average (8).....	9.61	6.26	19.69	39.91	10.23	14.30	11.37	37.7
9887	Japan Rice.....	11.15	10.90	18.97	33.57	9.45	15.96	11.08	35.4
11154	Japan Rice.....	11.78	9.74	15.98	40.82	9.65	12.03	8.33	25.7
	Average (2).....	11.47	10.32	17.48	37.20	9.55	14.00	9.71	30.6
9613	Blue Rose Rice.....	11.63	11.55	20.86	36.00	6.79	13.17	9.33	41.5
9857	Blue Rose Rice.....	8.48	6.57	24.80	34.71	9.13	16.31	13.33	54.2
11152	Blue Rose Rice.....	10.30	8.31	18.41	39.37	9.86	13.73	10.86	33.6
11153	Blue Rose Rice.....	9.39	7.21	24.07	33.03	9.75	16.55	13.79	51.8
11155	Blue Rose Rice.....	10.85	9.32	20.28	36.06	9.53	13.96	10.50	39.6
11156	Blue Rose Rice.....	7.75	9.83	25.94	29.63	8.58	18.27	14.79	57.9
11157	Blue Rose Rice.....	7.46	5.40	24.97	32.20	8.98	20.99	17.97	54.7
11166	Blue Rose Rice.....	9.06	6.09	22.83	34.40	10.04	17.58	14.80	47.8
11167	Blue Rose Rice.....	10.94	8.53	19.49	35.50	9.32	15.22	12.01	36.7
11168	Blue Rose Rice.....	10.04	8.09	21.60	35.47	9.57	15.23	12.22	43.9
11169	Blue Rose Rice.....	8.73	7.49	23.14	32.38	10.80	17.46	14.59	48.8
11220	Blue Rose Rice.....	10.53	8.57	21.49	35.18	8.89	14.34	10.92	43.5
	Average (12).....	9.60	8.16	22.33	34.49	9.35	16.07	12.93	46.3
	Average of all (22).....	9.77	7.66	20.92	36.73	9.69	15.23	12.06	41.7

ther be recognized that this mixture is, and has been for a number of years, sold under the name of rice bran. Further, the rice bran prepared by the old mortar and pestle method, always contained a certain amount of hulls.

If we assume that the stone bran consists of a mixture of rice hulls and huller bran of the average compositions given in Tables Nos. 13 and 15 it is possible to calculate the percentage of hulls from the crude fiber by means of the formula:

$$X = \frac{F - 8}{39 - 8} = \frac{F - 8}{31}$$

In this formula, F is the crude fiber content of the bran.

Calculated in this way, the stone bran contains from 19.6 to 57.2 per cent. hulls, with an average of 41.6 per cent. (Table No. 11.) Some of these samples of stone bran evidently contain excessive quantities of hulls.

If we assume that the stone bran is composed of hulls and another product, calculate the hulls, and subtract the material in the hulls from the remainder, we find that the residual stone bran has the composition given in Table No. 12. The table shows the method of calculation. The residue is lower in ether extract and higher in ash and insoluble ash than the average for huller bran. The lower fat is prob-

ably due to broken rice; the higher ash and insoluble ash, to the presence of dirt or sand. The stone bran may be regarded as a mixture of huller bran and hulls, with some dirt.

Chits.

The stone bran reel usually carries a section of so-called "chit" wire (8x8, No. 17 wire) after the stone bran wire. The chits consist of broken rice, and are removed at this point to avoid their being lifted out along with the hulls by the air blast which removes the hulls. Some hulls go along with the chits, and a large quantity of hulls may go with them, if it is desired, or if proper care is not exercised. Wooden valves above the conveyors permit the chits to be diverted either to the hull house, or to the huller, according to what they consist of. Some mills also lift almost all of the hulls out of the chits before milling them.

The chits are passed into the hullers. In some mills, they are milled on a separate huller, which is the better plan, but in many mills they are mixed with the whole brown rice in one or more hullers. It is of course difficult to mill the broken rice without breaking more of the whole rice, for which reason it is better to mill the chits separately.

TABLE 12. COMPOSITION OF RESIDUE FROM STONE BRAN AFTER HULLS HAVE BEEN DEDUCTED.

	Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.	Insoluble ash.
In 100 lbs. stone bran (average).....	9.77	7.66	20.92	36.73	9.69	15.23	12.06
In 41.6 lbs rice hulls (average).....	1.48	7.38	16.24	12.22	3.53	7.73	7.28
In 58.4 lbs residue.....	8.29	7.28	4.68	24.51	6.16	7.50	4.78
In 100 lbs. residue of stone bran.....	14.19	12.46	8.01	41.96	10.54	12.84	8.18
In bran from hullers (average).....	14.97	16.89	7.90	42.98	9.84	7.42	1.41
In 100 lbs rice hulls.....	3.56	.93	39.05	129.38	8.49	18.59	6.74
							17.52

The rice bran from the huller milling chits alone, or with brown rice, contains hulls in addition to the true rice bran. The quantity of hulls will depend upon the amount present in the chits.

Table No. 23 shows the analyses of chits and of huller bran from a huller milling chits alone. The product contains 20.45 per cent. crude fiber. Calculating the hull content by the method previously given, we find that this huller bran contains 40 per cent. rice hulls. The quantity is, however, really larger, since the huller bran from the chits contains a larger proportion of ground or finely broken rice, than the ordinary huller bran, and as this rice contains less fiber than rice bran, the calculation gives low results.

Rice millers claim that the quantity of chits is small, and that the amount of hulls which get into rice bran in this way is not at all large. A miller may, however, run up the hull percentage in this way, either intentionally or through carelessness.

Huller Bran.

When the rice reaches the hullers, practically all the unhulled rice has been removed by the paddy machines, and only the brown rice is present. There may be some grains carrying hulls, but the percentage is small.

In the bottom of the huller is what is known as the huller bottom, or sieve, which allows the bran to discharge through it. It consists of sheet steel punctured with slits about one-half inch long, and from 3/64 to 4/64 inch wide. The bran which passes through contains some broken rice. This is removed in a reel with screen wire, 14x14, .028, and goes to the second huller or to the cones, as the case may be. Eventually a portion finds its way back to the bran.

Table No. 13 gives the composition of a number of samples of huller bran. One or two of these samples were evidently hullers receiving chits in addition to the brown rice. (See also comparison in Table No. 10.)

TABLE 13. COMPOSITION OF RICE HULLER BRAN.

Laboratory No.	Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.	Insoluble ash.
9584 Honduras	14.72	16.38	7.32	44.02	9.96	7.60	.84
9606 Honduras	13.39	12.41	5.75	48.49	11.49	8.52	.....
9828 Honduras	16.16	15.84	6.75	44.20	9.85	7.20	1.43
9834 Honduras	16.37	18.30	8.32	41.55	8.81	6.65	.84
9903 Honduras	13.26	15.92	8.08	43.78	9.41	7.55	.89
9904 Honduras	17.35	18.08	7.18	40.29	10.10	7.00	1.00
11174 Honduras	12.26	9.65	4.14	56.35	10.70	6.90	1.76
11180 Honduras	15.56	16.07	6.40	42.98	10.74	8.25	1.56
11189 Honduras	13.25	12.40	6.57	48.52	12.28	6.98	1.75
Average (9).....	14.92	15.01	6.72	45.58	10.37	7.41	1.26
9648 Japan	13.40	15.03	7.06	48.10	8.50	7.91	1.58
9886 Japan	13.75	16.58	11.62	40.68	9.11	8.26	1.89
11159 Japan	14.91	16.27	9.92	41.97	9.70	7.23	1.53
11160 Japan	15.07	17.73	7.89	43.44	9.14	6.73	.60
Average (4).....	14.28	16.40	9.12	43.55	9.11	7.53	1.40
9614 Blue Rose	16.81	19.83	8.06	40.69	7.22	7.39	.....
9858 Blue Rose	15.56	20.29	8.48	38.67	8.83	5.17	.67
11158 Blue Rose	15.53	19.75	8.52	40.07	8.94	7.19	.96
11161 Blue Rose	15.87	18.55	9.13	37.95	10.92	7.58	1.48
11170 Blue Rose	15.19	18.61	7.50	41.86	9.81	7.03	1.01
11171 Blue Rose	15.88	19.43	8.51	38.01	10.19	7.95	1.89
11172 Blue Rose	13.59	17.45	11.54	37.80	10.19	9.43	3.68
11173 Blue Rose	14.88	18.06	8.05	21.26	10.08	7.67	1.36
11174 Blue Rose	14.19	14.98	6.38	46.92	10.50	7.03	1.38
11219 Blue Rose	15.44	20.86	8.51	38.01	9.80	7.38	.....
Average (10).....	15.29	18.78	8.47	38.13	9.65	7.38	1.55

Averages are made separately for the Honduras rice, Blue Rose, and Japan. The bran from the Blue Rose and the Japan rice contains a higher average percentage of crude fiber. According to some rice millers, Blue Rose rice is covered with a hard, thin coating, and not only does not yield as much bran, but does not break or rub off as much as does the Honduras rice. Thus, the average crude fiber in the nine Hon-

duras huller brans is 6.72 per cent., and the average combined protein and fat is 29.93. The average crude fiber in the four Japan huller brans is 9.12, or 2.40 per cent. more than the Honduras, with 30.68 per cent. combined protein and fat. The average crude fiber in the ten Blue Rose huller brans is 8.47, or 1.75 per cent. more than in the Honduras huller bran, with 34.07 per cent. combined protein and fat, which is 4.14 more than that in the Honduras, and 3.39 more than that in the Japan. Individual analyses differ quite decidedly from these averages, but it is clear that the Blue Rose huller bran is richer in protein and fat than either of the other varieties. The difference in crude fiber is perhaps due partly to a higher hull content. The Blue Rose huller bran averages 1.55 per cent. insoluble ash and the Honduras 1.26 per cent. The difference is 0.29 per cent., which, if due to the presence of rice hulls, would equal $0.29 \times 2.15 = 0.62$ per cent. crude fiber difference in the rice hulls. The total difference in crude fiber is, however, 1.75. The huller bran of the Blue Rose in itself contains more crude fiber than the huller bran of Honduras rice. This may be due to the fact that more of the rice itself goes into the Honduras huller bran. If the insoluble ash in the huller bran is assumed to come from rice hulls, as it probably does, then the average crude fiber from rice hulls in the brans would be:

Honduras	2.70%
Japan	3.01%
Blue Rose	3.33%

The net average crude fiber in the huller bran, free from hulls, would then be:

Honduras	4.02%
Japan	6.11%
Blue Rose	5.14%

We prefer, however, to base calculations upon the huller bran as actually secured from the machines.

Cone Bran.

The cones usually take the place of the second break hullers. Some mills have no cones, but use second, or more rarely, third break hullers, and then the brushes. For this reason, the by-product belongs with the rice bran rather than with the polish. If cone bran is sold separately, a more appropriate term is rice cone meal. Most mills mix it in with the huller bran and the stone bran.

Table No. 14 shows the composition and the average composition of the cone bran. As compared with the huller bran, it contains less crude fiber and slightly less ash. As compared with the rice polish, it contains more protein, fat, fiber, and ash, and less nitrogen-free extract.

TABLE 14. BRAN FROM PEARLING CONES.

Laboratory No.		Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.	Insoluble ash.
9593	Honduras.....	16.52	20.32	8.00	38.35	8.84	7.97	.51
9483	Honduras.....	16.49	11.78	3.23	52.03	11.08	5.39	.39
9820	Honduras.....	15.66	16.83	7.90	44.15	8.54	6.92	1.09
9844	Honduras.....	15.63	14.77	3.49	50.56	8.83	6.72	.81
9899	Honduras.....	12.50	13.00	2.50	55.94	10.64	5.42	.67
11194	Honduras.....	14.06	12.63	3.35	50.84	11.50	7.62	1.77
9859	Blue Rose.....	16.52	20.32	8.00	38.35	8.84	7.97	.82
9884	Japan.....	15.70	18.11	8.79	38.93	9.86	8.61	.94
	Average (8).....	15.39	15.97	5.66	46.13	9.77	7.08	.88

Rice Hulls.

Rice hulls have a very low feeding value, as they are digested to a very small extent by animals. It has even been claimed that they are irritating and dangerous to the stomach and intestines of animals, but there is no definite evidence that such is the case. They have, however, a very low feeding value, and may be considered more of a filler than anything else. Rice hulls contain about 0.3 pound digestible protein in every 100 pounds, which is about one-tenth of the digestible protein in Johnson grass hay, or one one-hundred-twentieth of that in cottonseed meal. They have a productive value of approximately 3.2 pounds per hundred. That is to say, 100 pounds ground rice hulls will produce 3.2 pounds fat on an animal already receiving enough feed for maintenance. This is about two-fifths the productive value of Johnson grass hay, one-fourth the productive value of wheat bran, and one-sixth the productive value of cottonseed meal. Rice hulls have a lower feeding value than any hay, straw, or fodder sold in Texas.

Table No. 15 shows the composition of some samples of rice hulls

TABLE 15. RICE HULLS.

Laboratory No.		Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.	Insoluble ash.
9585	Honduras.....	3.21	1.08	39.10	29.05	9.15	18.41	17.43
9608	Honduras.....	4.56	.54	38.85	28.23	10.30	19.52	18.43
9477	Honduras.....	4.57	.76	31.43	38.83	10.95	15.83	14.55
9818	Honduras.....	3.00	.97	39.24	31.70	8.38	16.67	15.78
9835	Honduras.....	2.45	.65	40.14	28.58	8.69	19.49	18.60
9902	Honduras.....	2.88	.72	40.19	27.63	8.88	19.70	18.86
9839	Honduras.....	4.88	.80	36.72	30.59	7.98	19.03	17.82
9611	Blue Rose.....	1.78	.63	46.37	25.98	6.11	19.13	18.18
9850	Blue Rose.....	5.00	.94	42.09	24.56	7.98	19.43	18.30
9880	Japan.....	3.85	1.98	40.55	25.51	8.33	19.78	18.07
9642	Red.....	2.51	.78	38.08	29.67	6.76	22.00	20.84
11193	Rice hulls.....	3.19	.70	36.03	30.64	10.48	18.96	18.01
11205	Rice hulls.....	4.88	1.67	35.22	34.64	8.76	14.83	13.69
11204	Ground hulls.....	3.06	.77	42.69	29.91	6.09	17.48	16.75
	Average (14).....	3.56	.93	39.05	29.38	8.49	18.59	17.52
	Average (3) (Bulletin 73).....	3.67	1.50	39.37	29.27	8.42	17.77	16.77

collected in the course of this investigation. The quantity of crude fiber varies from 35.22 to 46.37 per cent. The average is 39.05, and we will base our calculations upon 39 per cent.

Rice hulls contain high quantities of ash, most of which is silica, and, therefore, appears as *insoluble ash*. The insoluble ash varies from 13.69 to 20.84 with an average of 17.52 per cent. The average ratio of crude fiber to insoluble ash is 2.15 to 1. The percentage of insoluble ash may be used to estimate the quantity of rice hulls in a feed. In the case of rice bran, however, insoluble ash from the dirt in the stone bran is also present. (See under stone bran.)

RICE BRAN.

Commercial rice bran consists of a mixture of the stone bran, the bran from the hullers, and the cone bran. Some mills mix the cone bran with the rice polish and sell it as polish, and some sell it separately as cone meal, but since the cones take the place of a huller, the product is really bran and belongs with the bran. When the cone bran is omitted, the mixed bran contains a larger proportion of the inferior product, stone bran, than it otherwise would contain.

Some few rice millers also have a tendency to consider the rice bran as a mixture of all by-products of the rice milling supposed to have a feeding value, and accordingly wish to put in it dust, light rice, or a portion of the light rice, and sometimes ground chicken feed, or other by-products of the milling. Such additions would be considered as adulterants, since these by-products can in no sense be considered as rice bran. If any such by-products are added, the product should be sold as a mixed feed.

There is also a tendency on the part of some mills to introduce as much hulls, directly or indirectly, as they can get by with. Some attempt to justify such additions by a claim that the rice hulls prevent the rice bran from souring or heating, and keep it in better condition. If rice hulls had this effect, of course their addition would be justified, but the mixture would not be rice bran, and the purchaser would still have the right to know what he was getting, and how much excess hulls were present. The objection would not be to making the mixture, but to misrepresentation, or deceit in selling the goods. However, the fact has not been well established that the addition of rice hulls helps to keep the bran.

In November, 1915, the Texas rice millers at a public hearing in regard to rice by-products, held at their request, asked that the crude fiber in the definition of rice bran be raised from 12 per cent. to 15 per cent. The standard had been 15 per cent. for a number of years, but had been lowered to 12 per cent. about a year previous. The rice millers stated that bran with 12 per cent. crude fiber could be made from Honduras rice, but that a new variety of rice, Blue Rose, was now extensively grown, which produced a bran containing more crude fiber than the Honduras. They also represented that the standard of 12 per cent. did not allow a sufficient margin for variation in the composition of the bran, due to variations in the milling properties of different lots of rice. A number of the samples reported in this bulletin

were collected for the purpose of studying the questions raised at this hearing.

On December 30, 1915, the definition of rice bran was changed by the Texas Feed Control Service to read as follows:

"Rice bran is the cuticle of the rice grain with only such quantity of hulls as is unavoidable in the regular milling of rice. It must contain not less than 11 per cent. protein, 10 per cent. fat, and not more than 15 per cent. crude fiber."

This definition requires the rice miller to exercise due care to keep as much hulls as possible out of rice bran. Rice bran is considered as adulterated if it contains an excess of hulls, excess of stone bran, immature rice, so-called chicken feed, dust, or any other milling product not properly belonging to rice bran as defined above, regardless of the protein, fat, or crude fiber present.

Composition of Rice Bran.

Rice bran is variable in composition, the variations depending on the milling properties of the rice and the milling conditions. The relative proportion of stone bran to huller bran also influences the composition.

The crude fiber content indicates the quantity of hulls present. The quantity of hulls also influences the protein and fat, since the higher the hulls, the lower the protein and fat. Rice bran also contains pulverized or broken rice. The quantity of broken rice may at times be 10 to 15 per cent. The broken rice also decreases the protein, fat, and ash, but does not increase the crude fiber.

Table No. 16 shows the composition of rice bran collected for the purpose of this investigation. Bran from Blue Rose or Japan rice runs somewhat higher in fiber than that from Honduras. The Blue

TABLE 16. MIXED RICE BRAN.

Laboratory No.	Variety.	Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.	Insoluble ash.	Digestible Protein.	Productive value.
9601	Honduras.....	13.09	10.38	8.45	47.59	10.39	10.10	4.55	8.68	18.16
9479	Honduras.....	14.50	12.62	11.75	41.21	11.95	7.97	3.18	9.34	17.24
9845	Honduras.....	14.24	12.96	13.01	41.87	8.95	8.97		8.91	16.83
11177	Honduras.....	13.50	14.13	7.39	44.61	10.89	9.48	2.30	8.95	19.57
11190	Honduras.....	13.94	13.78	7.22	44.68	12.15	8.23	2.48	9.24	19.47
9618	Blue Rose*	12.41	14.94	17.82	35.28	7.16	12.39	7.10	7.50	15.50
9860	Blue Rose.....	13.26	14.42	11.33	41.65	9.17	10.17	5.23	8.54	18.12
11147	Blue Rose.....	13.69	16.32	13.04	34.17	9.11	13.67	7.39	8.57	17.04
11148	Blue Rose.....	12.71	14.08	13.36	38.97	9.96	10.92	6.39	7.96	16.63
11149	Blue Rose.....	14.93	17.63	10.90	37.60	9.91	9.03	3.46	9.61	19.71
11162	Blue Rose.....	14.66	16.71	8.88	41.15	10.60	8.00	2.25	9.72	20.42
11163	Blue Rose.....	11.69	13.82	15.47	35.62	10.19	13.21	8.34	7.32	15.61
11164	Blue Rose.....	13.25	15.02	15.23	36.86	8.76	10.88	5.90	8.29	16.73
11165	Blue Rose.....	13.79	16.73	10.62	40.07	9.77	9.02	3.65	9.02	19.58
11218	Blue Rose.....	14.35	16.96	14.29	35.18	9.82	9.40	4.38	8.98	17.64
9883	Japan.....	14.92	16.32	10.24	39.61	9.34	9.57	2.63	9.78	19.44
11145	Japan.....	13.62	15.10	11.46	42.09	9.69	8.04	2.91	8.77	18.63
9646	Red.....	12.73	14.20	10.01	44.38	8.15	10.53	4.36	8.33	18.96
	Average (18)....	13.63	14.78	11.69	40.14	9.78	9.98	4.50	8.75	18.07

*Excess of hulls present.

Rose rice is usually hard and flinty, and does not rub off or break up finely in milling. This causes the huller bran to contain more crude fiber and also decreases its quantity relatively to the stone bran, which thus causes another increase in fiber, on account of the greater proportion of stone bran present.

Table No. 17 contains the composition of rice brans averaged by periods of six months from samples collected by the Feed Control Service. The tables from which these averages were calculated contain some illegal samples, which affect the average to some extent.

TABLE 17. AVERAGE COMPOSITION OF RICE BRAN BY PERIODS OF SIX MONTHS (FEED CONTROL SAMPLES).

Period.	Number averaged.	Protein.	Ether extract.	Crude fiber.	Nitrogen free extract.	Water.	Ash.	Digestible protein.	Productive value.
July 1, 1907 to Jan. 1, 1908	22	12.34	11.49	9.73	46.38	11.21	8.85	8.07	17.87
Jan. 1, 1908 to July 1, 1908	5	13.13	12.49	12.64	41.51	10.57	9.66	8.46	17.01
July 1, 1908 to Jan. 1, 1909	15	12.51	11.84	9.89	47.14	10.29	8.32	8.18	18.24
Jan. 1, 1909 to July 1, 1909	3	11.37	9.10	14.80	43.03	10.57	11.13	7.12	14.51
July 1, 1909 to Jan. 1, 1910	16	12.96	12.16	12.16	42.69	9.44	10.59	8.35	17.06
Jan. 1, 1910 to July 1, 1910	14	11.91	10.81	12.45	44.93	10.31	9.59	7.67	16.62
July 1, 1910 to Jan. 1, 1911	10	12.19	11.85	10.61	47.05	9.11	9.19	7.97	18.19
Jan. 1, 1911 to July 1, 1911	19	12.13	11.04	11.75	46.33	9.51	9.24	7.81	17.08
July 1, 1911 to Jan. 1, 1912	5	11.84	11.56	11.80	44.15	11.43	9.22	7.62	16.47
Jan. 1, 1912 to July 1, 1912	2	10.88	8.25	8.38	51.17	12.90	8.42	7.21	17.44
July 1, 1912 to Jan. 1, 1913	19	12.37	13.11	11.61	43.74	9.42	9.75	7.97	17.80
Jan. 1, 1913 to July 1, 1913	14	12.08	11.53	13.11	42.71	10.30	10.27	7.56	15.91
July 1, 1913 to Jan. 1, 1914	26	11.74	10.12	12.97	42.87	11.88	10.42	7.35	15.84
Jan. 1, 1914 to July 1, 1914	26	12.05	9.74	11.19	44.45	11.04	11.53	7.76	15.99
July 1, 1914 to Jan. 1, 1915	21	12.88	12.49	11.58	42.49	10.49	10.17	8.29	17.18
Jan. 1, 1915 to July 1, 1915	33	11.62	10.25	15.82	41.65	9.54	11.12	7.27	14.85
July 1, 1915 to Jan. 1, 1916	26	12.41	13.00	14.58	39.45	9.33	11.23	7.77	16.05

The table also shows the average productive values and the average digestible protein present. These will be discussed in a subsequent section.

HULLS IN RICE BRAN.

The quantity of hulls in rice bran may be estimated from the quantity of crude fiber present. This estimate may be based upon the average composition of huller bran and the average composition of rice hulls. If broken rice is present in addition to the hulls and huller bran, the figures for hulls will be too low.

The percentage of hulls may be calculated by the formula:

$$X = \frac{F - R}{H - R}$$

when X = per cent. hulls

F = per cent. fiber in the bran

R = per cent fiber in the huller bran

H = per cent. fiber in hulls.

If we assume the average fiber in huller bran to be 8 per cent. (Table No. 13) and that of hulls to be 39 per cent. (Table No. 15), the formula becomes

$$X = \frac{F-8}{39-8} = \frac{F-8}{31}$$

The quantity of hulls present for various grades would then be approximately:

Crude Fiber Per Cent.	Hulls Per Cent.
8	0
10	6.4
12	12.9
15	22.6

RICE POLISH.

The composition of rice polish is somewhat variable, depending on the kind of rice to be milled. If the rice is soft and breaks up finely, or rubs off, it goes into the polish. As the rice itself is low in fat and protein, its presence reduces the protein and fat content of the polish. If, on the other hand, the rice is hard or flinty, and does not break up finely or rub off, the polish consists more largely of the outer coating of the rice and contains a comparatively high percentage of fat. The presence of pulverized or broken rice accounts for the low fat in some samples of rice polish. It is not to the interest of the miller for rice to go into the polish, as even brewer's rice has a higher commercial value than rice polish.

Table No. 18 shows the composition of the samples of rice polish collected along with the samples of rice studied in this bulletin. Table

TABLE 18. RICE POLISH, FROM BRUSHES.

Laboratory No.	Variety.	Protein.	Ether extract.	Crude fiber.	Nitrogen free extract.	Water.	Ash.	Pentosans.
9586	Honduras.	12.91	5.62	2.18	66.17	9.84	3.26	.76
9605	Honduras.	12.79	7.75	2.79	60.34	10.76	5.57	1.36
9484	Honduras.	13.02	6.23	1.52	66.25	10.57	2.41	.12
9826	Honduras.	14.45	11.35	1.90	58.44	10.31	3.55	.....
9837	Honduras.	11.13	6.71	1.63	67.28	10.30	2.95	.53
9908	Honduras.	14.24	9.22	2.28	59.43	10.14	4.69	.....
9615	Blue Rose.	14.03	12.95	2.53	55.70	8.86	5.93	.....
9852	Blue Rose.	11.39	11.27	2.00	61.46	9.91	3.97	.33
9888	Japan.	12.59	10.23	2.13	60.33	9.98	4.74	.48
9641	Red Rice Series.	12.24	9.34	2.20	62.76	8.46	5.00	.....
	Average (10).....	12.88	9.07	2.12	61.81	9.91	4.21	.60

No. 19 contains the composition of rice polish averaged by periods of six months, from samples collected for the Feed Control Service. The average digestible protein and productive values are also given; these are discussed in the next section.

TABLE 19. AVERAGE COMPOSITION OF RICE POLISH BY PERIODS OF SIX MONTHS (FEED CONTROL SAMPLES).

Period.	Number averaged.	Protein.	Ether extract.	Crude fiber.	Nitrogen free extract.	Water.	Ash.	Digestible protein.	Productive value.
July 1, 1907 to Jan. 1, 1908	20	11.97	9.18	2.63	61.46	9.79	4.97	8.06	20.31
Jan. 1, 1908 to July 1, 1908	3	12.39	10.72	3.62	59.07	9.49	4.71	8.34	20.58
July 1, 1908 to Jan. 1, 1909	16	12.68	9.12	2.72	61.53	9.31	4.64	8.53	20.41
Jan. 1, 1909 to July 1, 1909	2	12.75	9.01	2.58	59.15	10.46	6.05	8.58	19.82
July 1, 1909 to Jan. 1, 1910	16	13.23	10.87	3.40	58.23	9.02	5.25	8.90	20.61
Jan. 1, 1910 to July 1, 1910	4	12.13	8.36	2.26	62.97	10.22	4.08	8.16	20.28
July 1, 1910 to Jan. 1, 1911	5	12.10	9.87	2.70	60.78	9.87	4.68	8.14	20.52
Jan. 1, 1911 to July 1, 1911	9	12.56	10.58	3.37	57.49	9.81	6.19	8.45	20.13
July 1, 1911 to Jan. 1, 1912	6	11.56	8.11	2.62	62.45	10.89	4.47	7.78	19.95
Jan. 1, 1912 to July 1, 1912	14	11.81	10.21	2.88	60.84	8.90	5.36	7.95	20.65
July 1, 1912 to Jan. 1, 1913	2	12.80	10.95	2.79	58.94	9.69	4.83	8.61	20.74
Jan. 1, 1913 to July 1, 1913	15	11.52	7.40	2.38	62.20	11.39	5.11	7.75	19.55
July 1, 1913 to Jan. 1, 1914	20	12.29	9.45	2.53	59.80	10.36	5.57	8.27	20.11
Jan. 1, 1914 to July 1, 1915	2	12.41	7.79	1.88	63.65	10.30	3.91	8.35	20.21
July 1, 1915 to Jan. 1, 1916	13	12.85	10.17	2.61	59.63	9.32	5.42	8.65	20.52

THE FEEDING VALUE OF BRAN AND POLISH.

The feeding value of rice bran and rice polish depends upon (a) the quantity of digestible protein, (b) the productive value, and (c) the suitability to the animal.

The digestible protein is used for the purpose of building or repair of muscle, cell tissue, and organs of the body, which are chiefly composed of proteids. It is also used for hair, wool, and for the casein of milk.

The productive value is expressed in terms of fat, and is the quantity of fat that would be produced on a fattening animal when added to a ration already sufficient to supply the needs of the animal for maintenance. It represents the part of the feed available for body uses, after all losses have been deducted, due to digestion, fermentation, and body activities necessary to prepare the food for the use of the animal.

The productive value is used for heating the animal body and for supplying it with energy to be used in body motions, beating of the heart, and other vital activities. It is also used for the production of body fat, or the sugar and fat of milk. It also furnishes the energy used when an animal works.

Animals require more productive value in their food than they do protein. For example, while a fattening steer that weighs 1000 pounds requires only 1.8 pounds of digestible protein, he should receive from 2.8 to 3.6 pounds productive value.

The digestible protein and the productive values are ascertained by means of digestion experiments and other tests with animals. Diges-

tion experiments with rice bran and rice polish are given in bulletin No. 166 of this Station. The digestible protein of a given feed is found by multiplying the protein by the coefficient of digestibility of the protein. The productive value is ascertained by multiplying each constituent of the feed by its production factor, and adding the products. If the value for crude fiber is negative, it is subtracted. (See Bulletin No. 185 for a discussion of these factors.)

Since the values of rice bran and rice hulls are different, the proportion of hulls in rice bran, which can be judged by the crude fiber content, affects the production coefficients. The production coefficients for different grades of rice are given in Table No. 20.

TABLE 20. PRODUCTIVE COEFFICIENTS OF RICE BY-PRODUCTS.

	Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Coefficient of digestibility of protein.
Rice bran, 8 per cent fiber (7-9), 0 hulls.....	.155	.540	.023	.217	.663
Rice bran, 10 per cent fiber (9-11), 6.4 hulls.....	.153	.539	0	.211	.654
Rice bran, 12 per cent fiber (11-13), 12.9 hulls.....	.151	.538	-.016	.205	.644
Rice bran, 15 per cent fiber (13-16.5), 22.6 hulls.....	.147	.536	-.032	.198	.626
Rice bran, 19 per cent fiber (16.5-19), 32.3 hulls.....	.142	.533	-.042	.185	.604
Rice bran, 20 per cent fiber (19-21).....	.138	.530	-.048	.178	.588
Hulls.....	.024	.318	-.070	.087	.10
Polish.....	.158	.490	-.010	.227	.673

The methods used in working these out are readily seen by reference to Table No. 21 and are described in a subsequent section.

TABLE 21. COMPOSITION AND PRODUCTIVE VALUES OF BRAN AND HULLS (CALCULATIONS).

		Protein.	Ether Extract.	Crude Fiber.	Nitrogen free extract.	Water.	Ash.
Rice bran, 12 per cent fiber, 100 lbs.	L	13.0	12.5	12.0	42.0	10.5	10.0
Hulls, 12.9 lbs.	.129B	.45	.13	5.03	3.81	1.10	2.39
Residue, 87.1 lbs.	C	12.55	12.37	6.97	38.19	9.40	7.61
Per cent in residue.	$A = \frac{C}{B} = \frac{87.1}{12.9}$	14.41	14.20	8.00	43.85	10.79	8.74
Hulls, 100 lbs.	B	3.5	1.0	38.0	29.5	8.5	18.5
Rice bran, 8 per cent fiber, 93.6 lbs.	.936A	13.49	13.29	7.49	41.04	10.10	8.18
Hulls, 6.4 lbs.	.064B	.22	.06	2.50	1.89	.54	1.18
Composition 10 per cent fiber (total 100 lbs.)	S	13.71	13.35	9.99	42.93	10.64	9.36
Rice bran, 8 per cent fiber, 77.4 lbs.	.774A	11.15	10.99	6.19	33.94	8.35	6.76
Hulls, 22.6 lbs.	.226B	.79	.23	8.81	6.67	1.92	4.18
Composition, 15 per cent fiber (total 100 lbs.)	D	11.94	11.22	15.00	40.61	10.27	10.94
Rice bran, 8 per cent fiber, 67.7 lbs.	.677A	9.76	9.61	5.42	29.69	7.30	5.92
Hulls, 32.3 lbs.	.323B	1.13	.32	12.59	9.53	2.74	5.97
Composition 18 per cent fiber, total 100 lbs.	E	10.89	9.93	18.01	39.22	10.04	11.89
Rice bran, 8 per cent fiber, 61.3 lbs.	.613A	8.83	8.70	4.90	26.88	6.61	5.36
Hulls, 38.7 lbs.	.387B	1.35	.39	15.09	11.42	3.29	7.16
Composition 20 per cent fiber, total 100 lbs.	F	10.18	9.09	19.99	38.30	9.90	12.52

TABLE 21. COMPOSITION AND PRODUCTIVE VALUES OF BRAN AND HULLS (CALCULATIONS).

	Ash.	Protein.	Ether Extract.	Crude Fiber.	Nitrogen free extract.	Digestible protein.
Production coefficient, 12 per cent fiber.	H	.151	.538	— .016	.205	.644
Production coefficient, hulls.	I	.024	.318	— .070	.087	.10
Productive value, 12 per cent fiber.	HL	1.963	6.725	— .192	8.610	8.37
Productive value, hulls.	IB=K	.064	.318	— 2.730	2.567	.35
Productive value, 100 lbs., 12 per cent.	HL	1.963	6.725	— .192	8.610	8.37
Productive value, 12.9 lbs., hulls.	HL .129K	.011	.041	— .352	.331	.05
Residue 87.1 lbs.	M	1.962	6.684	.160	8.279	8.32
Productive coefficient, 8 per cent fiber.	M/C	.153	.540	.023	.217	.663
Productive value, 100 lbs., 8 per cent.	M = P	2.098	7.182	.173	8.896	8.94
Productive value, 93.6 lbs., 8 per cent.	.871 .936P	2.098	7.182	.173	8.896	8.94
Productive value, 6.4 lbs., hulls.	.064K	.005	.020	— .175	.164	.02
Productive value, total 100 lbs.	R	2.103	7.202	0	9.060	8.96
Productive coefficient, 10 per cent fiber.	R/S	.153	.540	0	.211	.654
Productive value, 77.4 lbs., 8 per cent.	.774P	1.73	5.94	.142	7.36	7.39
Productive value, 22.6 lbs., hulls.	.226K	.02	.07	— .620	.58	.08
Productive value, total.	T	1.75	6.01	— .478	7.94	7.47
Productive coefficient, 15 per cent fiber.	T/D	.147	.536	— .032	.196	.626
Productive value, 67.7 lbs., 8 per cent.	.677P	1.52	5.19	.13	6.43	6.47
Productive value, 32.3 lbs., hulls.	.323K	.03	.10	— .88	.83	.11
Productive value, total.	U	1.55	5.29	— .75	7.26	6.58
Productive coefficient, 18 per cent fiber.	U/E	.142	.533	— .042	.185	.604
Productive value, 61.3 lbs., 8 per cent.	.613P	1.37	4.70	.07	5.83	5.85
Productive value, 38.7 lbs., hulls.	.387K	.03	.12	— 1.06	.99	.14
Productive value, total 100 lbs.	V	1.40	4.82	— .99	6.82	5.99
Productive coefficient 20 per cent fiber.	V/F	.136	.530	— .048	.178	.648

The productive values and digestible protein of the average rice brans and rice polish are given in Tables Nos. 17 and 19, in connection with the average composition. Table No. 16 also shows the composition of the rice bran collected in connection with these studies.

Excluding 9618, which contains an excess of hulls, the mixed bran samples collected vary in digestible protein from 7.32 to 9.78 pounds in 100 pounds, and the productive values from 15.61 to 20.42 pounds per 100 pounds. This is quite a decided variation in feeding value, especially in productive value.

The averages for the rice bran (Table No. 17) vary from 7.12 to 8.46 pounds digestible protein in 100 pounds, and from 14.85 to 18.24 pounds productive value expressed as fat. This is also a decided average variation in feeding value. Some of the samples included in the averages were adulterated with hulls.

The variations are due chiefly to variations in fat and crude fiber. Increase in crude fiber decreases the feeding value; increase in fat increases the feeding value.

The average digestible protein in rice polish (Table No. 19) varies from 7.75 to 8.90, and the productive value from 19.55 to 20.74. The rice polish does not, therefore, vary in average yearly composition as much as does the rice bran, and it has a higher productive value.

Calculation of Production Coefficients.—The method of calculating the production coefficients of various grades of rice bran is as follows (see Table No. 21):

Starting with rice bran containing 12 per cent. fiber, and of the assumed average composition (L), we estimate that it contains in 100 pounds, 12.9 pounds hulls of the composition (B). Subtracting the constituents calculated to be present in this quantity of hulls from the constituents in 100 pounds bran (L), we have 87.1 pounds residue, containing the nutrients (C), which, calculated to 100 pounds, gives the composition of rice bran assumed to contain 8 per cent. crude fiber, to be $A = C$, as given in the table.

87.1

The composition of other grades of rice bran are then calculated on the basis of the quantity of hulls (B) and of bran containing 8 per cent. fiber (A), necessary to give the desired fiber content.

Next, using the production coefficients found for 12 per cent. fiber bran (H) and for hulls (I), the productive values of 12 per cent. fiber bran (HL) and of hulls ($IB=K$), are calculated.

Then from the productive values of each constituent of 100 pounds of 12 per cent. bran (HL), we subtract the productive value of each constituent in 12.9 pounds hulls (.129K). The residue (M) shows the productive value of each constituent of the quantity (C), and dividing M by C, we obtain the production coefficients of the constituents of 8 per cent. fiber bran (M/C). The productive values of each constituent in 100 pounds (P) is secured by dividing M by .871.

The production coefficients of the other grades are now secured by using the production coefficients (P) of the 8 per cent. bran. Thus for 10 per cent. fiber bran, we calculate the productive values of 93.6 pounds of 8 per cent. bran (.936P) and add the productive value of

6.4 pounds hulls (.064K). The sum is the productive value of the constituents of 10 per cent. bran of the composition S, and by dividing by S, we secure the values for the production coefficients of 10 per cent. fiber bran (R/S). See Table No. 21.

The productive values of the other grades are secured in the same way.

THE EXTRACTION OF FAT FROM RICE BRAN.

Rice bran contains fairly large quantities of fat, and rice huller bran still larger percentages. The matter of extracting this fat commercially has been considered. In order to extract the oil, it would be necessary to erect a separate plant and take it out by means of gasoline or some other solvent. It is hardly likely that such arrangements in connection with a rice mill would give satisfactory results. This process is somewhat expensive. It is also claimed that the oil is suitable only for the purpose of making soap. A plant was erected at Crowley, Louisiana, for the purpose of extracting the fat from rice bran, but for some reason or other the venture did not prove profitable and the project was abandoned.

MINERAL CONSTITUENTS OF BY-PRODUCTS.

Table No. 22 shows the mineral constituents of the by-products analyzed in connection with this investigation, variable numbers being averaged. See Table No. 26 for details.

TABLE 22.—AVERAGE COMPOSITION OF RICE BY-PRODUCTS.

	Phosphoric acid.	Potash.	Insoluble ash.	Lime.	Magnesia.	Reducing sugar.	Di. sugar.	Pentosans.
Hull ashes.....	0.57	0.58	96.97	.57	0.12	.....	.....	.....
Stone bran.....	1.39	0.61	.....	.16	0.52	0.78	1.15	13.87
Huller bran.....	3.47	1.42	.....	.12	1.21	1.20	4.51	7.76
Cone meal.....	3.19	1.58	.....	.09	1.21	1.55	2.15	5.81
Mixed bran.....	2.84	1.09	.....	.13	0.93	1.71	3.12	10.13
Hulls.....	.....	0.24	.....	.11	0.09	0.24	0.43	18.14
Polish.....	1.73	0.66	.....	.09	0.62	1.27	2.26	3.47

The mixed bran contains on an average 2.84 per cent. phosphoric acid and 1.09 per cent. potash. There is also present 2.18 per cent. nitrogen. With phosphoric acid and potash at 6 cents and nitrogen at 20 cents, the mixed rice bran would have a fertilizer valuation of \$13.43 per ton. Spoiled rice bran, unsuitable for feeding, could thus be used for fertilizing purposes.

By properly saving the manure, it ought to be possible to recover from 50 to 75 per cent. of the fertilizing value of rice bran. In order to do this, the liquid manure must be saved as well as the solid manure. If one-half of the fertilizing value were saved, this would represent \$6.72 for each ton of rice bran fed, a value well worth saving.

Rice polish would have a fertilizer valuation of \$10.89 per ton if we use the same valuations as those above. It contains on an average 2.00 per cent. nitrogen.

Rice by-products contain more magnesia than lime. This is evident in all the analyses, except those of the hulls.

SUGARS AND PENTOSANS.

See Table No. 22 for averages, and Table No. 26 for details. The mixed bran is richest in reducing sugars, perhaps on account of the inversion of some of the disaccharoses. The huller bran is richest in disaccharoses. The hulls contain the most pentosans, as might be expected from their woody nature. The by-products (except hulls) are also rich in starch, which was not determined in this work.

DUST.

Analyses of various samples of dust are given in Table No. 23. These samples are all high in ash and insoluble ash, with the exception of that from the aspirator on stone bran reel, showing the presence of considerable amounts of dirt. They are also low in protein and

TABLE 23. DUST.

Laboratory No.		Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.	Insoluble ash
9617	From rough dryers, Blue Rose.	5.58	2.56	16.03	25.50	7.37	32.96	29.58
9827	Honduras.	9.68	3.08	27.28	32.00	9.01	18.95	17.69
9836	From chaff grinder.	4.97	1.80	22.40	25.67	7.05	38.11	36.21
9896	From rough monitor, Honduras.	6.46	4.12	19.83	36.29	8.80	24.50	21.75
9865	Dust.	4.73	2.05	30.12	30.66	8.24	24.20	23.59
9889	Dust.	6.15	2.46	29.01	31.87	7.51	23.00	21.61
11186	From cyclone from rough rice shaker.	3.69	1.97	24.31	30.55	8.16	31.32	29.42
11191	From aspirator on stone bran reel.	12.00	13.48	13.96	39.58	9.50	11.48	5.57
11203	From cyclone from rough rice shaker.	3.94	1.10	18.94	24.64	7.19	44.19	42.11
	Average (9).	6.36	3.62	23.54	30.76	8.09	27.63	25.17

fat, and high in fiber, showing the presence of much woody material. On account of the quantity of dirt, the high fiber, and the low feeding value shown thereby, the dust from rough rice must be considered of very inferior feeding value and not at all a desirable feed.

The addition of such dust to rice bran or other rice by-products, must, therefore, be considered as a serious adulteration. The presence of this dust in a feed is highly objectionable.

MISCELLANEOUS.

Table No. 24 shows analyses of some miscellaneous samples.

The fiber and insoluble ash in the chits going to the hullers show the presence of rice hulls.

Light rice consists largely of hulls and has a low feeding value. The same is true of immature rice, which is another name for the same thing. Light rice, ground, and separated partly from the hulls,

TABLE 24. MISCELLANEOUS.

Laboratory No.		Protein.	Ether extract.	Crude fiber.	Nitrogen free extract.	Water.	Ash.	Insoluble ash.
11185	Chits, goes to huller.....	8.69	4.88	10.88	57.78	10.93	6.84	4.90
11197	Light rice.....	5.44	1.96	34.57	32.68	7.74	17.61	16.31
11199	Light rice tailings.....	6.78	1.77	25.11	32.06	7.28	27.00	21.55
11201	Immature rice.....	7.45	1.88	20.70	47.48	8.53	13.96	12.33
11202	Chits going into huller.....	8.94	7.22	8.49	56.94	10.52	7.89	5.03
11200	Huller bran from huller receiving chits.....	9.81	10.32	20.45	39.73	7.15	12.54	9.04
11215	Light rice after being ground.....	4.73	2.70	35.30	30.07	9.08	18.12	16.86
11216	Light rice, tailings discarded.....	2.75	0.94	42.34	25.89	9.26	18.82	17.82
	Average.....	6.83	3.96	24.73	40.32	8.81	15.35	12.98

consists chiefly of rice hulls. The addition of light rice to rice bran is, therefore, practically equivalent to adulteration with rice hulls.

RICE HULL ASHES.

Rice hull ashes consist chiefly of silica and contain little plant food. Analyses of several samples are given in Table No. 25. They contain, on an average, in 100 pounds, 0.58 pound phosphoric acid and 0.57 pound potash. If we assume a valuation of 6 cents a pound for phosphoric acid and 6 cents for potash, the valuation per ton would be

TABLE 25. HULL ASHES.

Laboratory No.	Insoluble ash.	Lime.	Magnesia.	Potash.	Phosphoric acid.
9610	97.85	.24	.01	.08	.36
186				.62	1.73
193				.80	.21
191				.71	.41
9564	95.28	.90	.23	.39	.44
11221				1.01	.20
11379				.35	.60
11380				.71	.63
Average.....	96.97	0.57	0.12	0.58	0.57

\$1.38. This would be above the normal value, as all the phosphoric acid is not available. If we assume a valuation of 40 cents for potash (which price has been reached under war conditions), the rice hull ashes would have a valuation of \$5.26 per ton. Polish at 40 cents a pound is, however, entirely too expensive to use as a fertilizer, and we consider the first valuation (\$1.38 per ton) to represent more nearly the fertilizing value of the ashes. Although this value is low farmers

could afford to haul the ashes home, if they were given to them, when their wagons would otherwise return empty.

TABLE 26. MISCELLANEOUS.

Laboratory No.		Lime.	Magnesia.	Potash.	Phosphoric acid.	Pentosans.	R. Sugar.	Di. Sugar.
	Stone Bran.							
9590		.15	.52	.72	1.55	10.43	.82	2.36
9613		.13	.70					
9602		.20	.47	.60	1.21	13.77	.48	.50
9476		.21	.43	.60	.50	14.53	1.04	.59
9823		.13	.41		1.10	16.44		
9857		.15	.46			15.37		
9846		.11	.38	.52		16.60		
9907		.17	.38			14.61		
9887		.17	.92			13.37		
11152					1.32	12.02		
11153					1.13	14.48		
11154					1.74	12.01		
11155					1.67	12.85		
11156					1.75			
11157					1.06			
11166								
11168					1.48			
11169					1.19			
11179					2.33			
	Average . . . . .	.16	.52	.61	1.39	13.87	.78	1.15
	Cone Meal.							
9593		.11	1.10	1.18	2.96	4.54	1.34	3.43
9483		.10	1.10	1.08	2.49	4.90	1.48	2.35
9820		.06	1.13		3.59	8.99		
9859		.01	1.29		2.35	5.65		
9844				1.32	3.08	4.63		
9899				1.08		4.18		
9884		.19	1.42	3.40	4.35	8.72	1.83	.60
11194				1.39	3.49	4.83		
	Average . . . . .	.09	1.21	1.58	3.19	5.81	1.55	2.15
	Bran from First Huller.							
9584		.12	1.29	1.51	3.48	7.60	1.02	4.04
9614					3.26			
9606				1.28	3.22			
9648		.10	1.16		3.57	6.67	.64	5.09
9828		.12	1.06		3.40	7.15		
9858		.14	1.39		4.44	8.15		
9834		.12	1.17	1.46	3.91	8.48		
9904		.17	1.13		3.35	7.71		
9886		.10	1.26		3.28		1.93	
11158					3.44	7.65		
11159					3.14	8.08		
11160					3.38	7.91		
11161					3.41	8.04		
11170					3.37			
11171					3.69	7.82		
11172					3.23			
11173					3.39			
11178					3.03			
11180					4.05			
	Average	0.12	1.21	1.42	3.47	7.76	1.20	4.57

TABLE 26. MISCELLANEOUS—Continued.

Laboratory No.		Lime.	Magnesia.	Potash.	Phosphoric acid.	Pentosans.	R. Sugar.	Di. Sugar.
	Mixed Bran.							
9618	.....	.16	.92			11.80		
9601	.....	.13	.83	1.09	2.75	7.69	1.54	2.03
9646	.....	.14	1.14		3.36	8.43		
9479	.....	.13	.83	1.07	2.21	14.39	1.63	1.71
9845	.....			1.12				
9883	.....	.10	1.28				1.97	5.58
9860	.....	.03	.99					
11145	.....	.14	1.00		2.85	8.74		
11147	.....	.18	1.28		3.43	9.79		
11148	.....	.12	.88		2.33	9.92		
11149	.....	.14	1.04		3.01			
11162	.....				3.07			
11163	.....				2.58			
11164	.....				2.52			
11165	.....				2.08			
11177	.....				3.87			
11146	.....	.14	.79			10.27		
	Average .....	.13	.93	1.09	2.84	10.13	1.71	3.12
	Hulls.							
9585	.....	.14	.10	.30	.32	19.13	.10	.44
9611	.....	.13	.12			19.66		
9608	.....	.11	.17	.25	.31	18.26	.08	.49
9642	.....	.13	.09		.13	18.00		
9477	.....	.10	.11	.27	.36	17.30	.33	.32
9818	.....	.09	.08			19.04		
9350	.....	.09	.05	.23		16.98		
9835	.....	.11	.06	.16		19.66		
9902	.....	.11	.04			19.40		
9880	.....	.11	.14			17.12	.46	.56
11193	.....					17.72		
11205	.....					15.26		
9839	.....	.13	.07	.21		18.24		
	Average .....	.11	.09	.24	.28	18.14	.24	.45
	Polish, Brush.							
9586	.....	.09	.45	.48	1.16	3.38	.85	1.61
9615	.....						
9605	.....	.10	.80	.78	2.33	3.43	1.40	2.20
9641	.....				2.63			
9484	.....	.06	.22	.55	1.21	3.06	.84	1.70
9826	.....						
9852	.....	.07	.72	.92	1.54	3.79		
9837	.....			.55	1.49	3.22		
9908	.....						
9888	.....	.13	.90			3.93	1.99	3.52
	Average .....	.09	.62	.66	1.73	3.47	1.27	2.26

ACKNOWLEDGMENT.

Analyses and other work involved in the preparation of this bulletin have been done by Messrs. Asbury, Buchwald, Enochs, Lebeson, Sprott, Ridgell, Weaver, and perhaps other members of the staff.

SUMMARY AND CONCLUSIONS.

1. A description of the process of rice milling is given.
2. Milling of rice partly removes phosphoric acid, potash, vitamins, and other constituents of the rice, and gives it a whiter and more attractive appearance.

3. Rice has a high food value, and is used almost exclusively as a food by some Eastern nations.

4. Brown rice has a brown color, with perhaps some greenish immature grains, and consists of the rice that has not been milled to remove the outer coating. It is richer in phosphoric acid and vitamins than polished rice, and its use cures or prevents certain diseases consequent on the almost exclusive use of polished rice. White rice cooks better and has a different taste.

5. Chicken feed, or rough rice screenings, contains chiefly weed seeds, broken rice, and dirt, and is variable in composition.

6. So-called stone bran is the sifting from rice hulls and rice, and consists largely of rice hulls, with some rice bran, germ, and broken rice.

7. Stone bran from Blue Rose rice contains more fat and more fiber on an average than that from Honduras rice.

8. Rice hulls also get into rice bran with the so-called chits.

9. Huller bran, or rice bran removed by the huller is rich in protein and fat and is practically free from hulls.

10. Rice hulls have a very low feeding value, but there is no evidence that they are actually poisonous or injurious to animals.

11. The rice bran on the market consists of a mixture of huller bran, cone bran, and stone bran. The addition of hulls, immature rice, inferior stone bran, excessive amounts of stone bran, chicken feed, dust, or any other milling by-product, is an adulteration.

12. Tables are given showing composition and productive values of rice bran and rice polish. These two products compare favorably with corn.

13. A method is given for calculating the hull content from the fiber content.

14. The production coefficients vary with the grade of the product, and so does the productive value and the digestible protein.

15. The extraction of fat from the rice bran has not been commercially successful.

16. Mineral and sugar contents of rice and its by-products are given.

17. Dust from rough rice contains much dirt and hulls, and its presence in a feed is highly objectionable.

18. Light rice consists chiefly of hulls, and the addition of light rice or the grindings from it, to rice bran, is an adulteration.

19. Rice hull ashes consist mostly of silica and have an average fertilizer valuation of \$1.38 per ton.

TEXAS AGRICULTURAL EXPERIMENT STATION

BULLETIN NO. 192

JUNE, 1916

DIVISION OF CHEMISTRY

Soils of Grayson, Lee, McLennan, Titus, and Tyler Counties



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BY

G. S. FRAPS, PH. D.
Chemist in Charge, State Chemist



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*As of June 1, 1916.

**In cooperation with United States Department of Agriculture.

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Soils of Grayson, Lee, McLennan, Titus and Tyler Counties

BY G. S. FRAPS, PH. D., CHEMIST IN CHARGE; STATE CHEMIST.

This bulletin is the fifth of a series dealing with the chemical composition of typical Texas soils. The preceding bulletins are Nos. 99, 125, 161, and 173. The samples were sent in by the soil survey agents of the Bureau of Soils of the United States Department of Agriculture, with the exception of those for Lee and McLennan counties, which were collected by this station.

Detailed reports of the surveys with maps showing the various soil types have been published by the Bureau of Soils, United States Department of Agriculture, from which the descriptions given in this bulletin are taken, as follows:

Soil Survey of Grayson County, by Frank Bennet et al.

Soil Survey of Lee County, by J. L. Burgess and W. S. Lyman.

Soil Survey of the Waco, Area, by A. W. Mangun and Mr. Earl Carr (part of McLennan county).

Soil Survey of Titus County, by Thomas B. Rice and E. B. Watson.

Soil Survey of the Woodville Area, by J. E. Lapham and party (part of Tyler county).

Requests for copies of these surveys should be addressed to the Bureau of Soils, United States Department of Agriculture, Washington, D. C.

MAINTENANCE OF FERTILITY.

The following are the chief essentials to the maintenance of soil fertility:

(1) Maintenance of vegetable matter and nitrogen by growing legumes and turning these under or grazing them off.

(2) Correction of deficiency in phosphoric acid, if needed, by use of phosphates.

(3) Correction for acidity, if present, by use of ground limestone or lime.

(4) Correction for deficiency of potash, if needed, by use of potash fertilizers.

1. *Vegetable Matter*.—The maintenance of the supply of vegetable matter in the soil is essential to the fertility of most soils, though some soils produce well for a long time without additions of vegetable matter, through liberal use of fertilizers. Vegetable matter may be supplied in farmyard manure, which is sufficient if the quantity available is enough, but barnyard manure is usually not at hand in large enough quantities. Legume crops, in such cases, should be grown in rotation

with other crops, and either turned under or grazed off. Turning under a heavy green crop may sour the land; if the crop is heavy, it is best to allow it to become nearly mature before turning it under. The plant tissues are then harder, decay less rapidly, and are less likely to cause sourness. We are still more in favor of grazing off the crop, as in this case, some of its feeding value is secured, while the droppings from the animal, together with the liquid excrement, contain the bulk of the plant food taken up by the crop. To make the crop into hay and save the manure from it is not such a good plan, as a large part of the fertility is lost in this way; and when the legume is made into hay, to be sold, the land gains practically nothing in fertility.

While other crops than legumes add vegetable matter to the soil when plowed under or grazed off, the legumes are the only plants that can utilize the free nitrogen of the air. On account of this fact legumes are chosen for the crop to be turned under or grazed off.

The maintenance of the nitrogen supply of the soil is more important than the maintenance of the vegetable matter. The only practical way to do this for farm crops is to secure the nitrogen from the air by growing legumes. Nitrogen costs too much for the planter to purchase enough of it to maintain the nitrogen content of the soil. The purchase of a small supplementary quantity may be profitable, but the main supply must come either from the soil, which then loses in fertility, or from the air by means of legumes.

It is not our intention to go into the matter of the kind of legumes to grow, except to say that corn grown in six-foot rows with cowpeas between, often produces as many bushels of corn the first year as corn grown in the usual way, and the second year, if the legumes are turned under or grazed off, it often produces eight to twelve bushels more. A cotton crop following the corn and cowpeas, likewise, is considerably larger.

2. *Phosphoric Acid*.—Soils are often deficient in phosphoric acid. The deficiencies of the soils discussed here will be shown later on. For discussion of the use of phosphates and other fertilizers, see Bulletin 167.

3. *Acidity*.—Some soils contain organic or inorganic acids, and are acid in character. Certain crops do not grow well in acid soils, especially clover, alfalfa, barley, rye, etc. There are other crops, such as cowpeas and watermelons, which do well on acid soils. Acidity may be corrected by adding lime, either as slaked lime, quicklime, or ground limestone rock. The last mentioned is usually the cheapest, and is preferable in other respects. The acidity or non-acidity of the soils is shown in connection with the analyses. Many of the soils of the area contain an abundance of lime, and do not need further additions.

4. *Potash*.—Soils as a rule contain an abundance of potash to produce good crops, though there is a variation in this respect. In general, potash is least often needed, and often needlessly used. The use of manure, the turning under of green crops, and the use of lime when needed, appear to assist the plants to secure potash from highly in-

soluble forms. The farmer should endeavor to secure the greatest benefit from his soil potash, before undertaking to purchase the fertilizer potash.

HOW TO USE THE ANALYSES.

Analyses of the soils are given in connection with the various types. The interpretation of the analyses and the pot experiments are also given.

If the soil is well supplied with plant food, but does not give good yields, its physical condition is poor, due to bad cultivation, poor drainage, inferior physical character, or other unfavorable physical conditions.

If the soil is well supplied with total plant food, but low in active plant food, attempts should be made to increase the activity of soil agencies which make plant food available, by means of addition of manure, of green crops, plowed under, or, if the soil is acid, by addition of lime or ground limestone.

If the crop yields are low and the plant food is deficient, the table shows the plant food that should be used first.

Suppose, for example, a farmer on Durant fine sand of Grayson county is securing a yield of one-fourth bale cotton per acre, what fertilizer should be used?

The table shows that this soil is deficient in nitrogen and in phosphoric acid. The farmer then should apply acid phosphate, for the purpose of furnishing phosphoric acid and cotton seed meal, for the purpose of furnishing nitrogen. These should increase the yields. But it would be still better for him to secure the nitrogen by growing legumes, and turning them under or grazing them off, and using acid phosphate to supply the phosphoric acid.

If truck crops were to be grown on this soil, some potash would probably be needed.

In the case of the Wilson clay loam, the analysis indicates the need of phosphoric acid first. With Wilson clay, also of Grayson county, nitrogen is needed first.

Other analyses should be examined in the same way.

For methods of interpretation of the analyses, see Bulletin 161.

In considering the pot experiments one should compare the soil containing the complete fertilizer (KPN) with the soil that has had the particular plant food, K (potash), P (phosphoric acid) or N, (nitrogen). Thus the effect of nitrogen is seen by comparing KP, which receives no nitrogen, with KPN, which had nitrogen, phosphoric acid and potash; the effect of phosphoric acid, by comparing KN, which receives no phosphoric acid, with KPN, which had nitrogen, phosphoric acid, and potash.

SOILS OF GRAYSON COUNTY.

Grayson county has an area of 1010 square miles. Its altitude varies from 520 to 900 feet above sea level. The greater portion of the county is gently rolling to rolling, but there are some rough, hilly areas in the northern and northeastern section, and also large areas of comparatively level country. A large portion of the soils of Grayson

county consists of black prairie lands of high fertility. Table 1 shows the areas of the various soils mapped in this county by the Bureau of Soils.

TABLE 1. SOIL SURVEY OF GRAYSON COUNTY.

Areas of Different Soils.

Soil.	Acres.	Per cent.
Houston black clay.....	137,088	21.2
Wilson clay.....	100,861	15.6
Susquehanna fine sandy loam.....	81,661	12.6
Durant fine sandy loam.....	46,848	7.2
Durant loam.....	45,440	7.0
Houston clay.....	44,096	6.8
Wilson clay loam.....	36,221	5.6
Trinity clay.....	31,176	5.3
Meadow.....	28,736	4.5
Miller fine sandy loam.....	26,688	4.1
Houston loam.....	13,120	2.0
Grayson clay loam.....	10,560	1.6
Crawford stony clay.....	9,661	1.5
Houston clay loam.....	7,168	1.1
Wilson loam.....	6,720	1.1
Rough stony land.....	6,528	1.0
Susquehanna clay.....	5,696	0.9
Crawford clay.....	3,320	0.6
Durant fine sand.....	1,600	0.3
Total.....	616,400	

The soils of this area are, as a rule, well supplied with total phosphoric acid, though the samples of Durant fine sand, Houston clay loam, and Wilson clay, are low in this respect. The analyses indicate that a number of these soils should, however, respond to fertilization with acid phosphate, as they appear to be somewhat low in active phosphoric acid. This is also shown in the pot experiments. The Durant fine sandy loam (2826) produces 16.5 grams corn without phosphoric acid (KN), 48.5 grams with phosphoric acid (KPN). The Houston clay loam (2944) produces good crops at first without phosphoric acid, but the second crops of corn (1912) without phosphoric acid (KN) is 17.6 grams, compared with 58.1 grams with phosphoric acid (KPN), and the following crops show large differences. The same is seen to occur in a number of the other pot experiments.

The soils are much better supplied with potash than either phosphoric acid or nitrogen.

The soils are, as a rule, better supplied with nitrogen than with active phosphoric acid, though this is not the case with all the soils. However, as is shown both by the analyses and the pot experiments, a number of these soils need nitrogen. Nitrogen is also rapidly lost under cultivation.

Not any of the soil samples were found to be acid.

We conclude that the great needs of this area for the maintenance of soil fertility are: first, legume rotation to maintain vegetable matter and nitrogen; second, use of acid phosphate to supply phosphoric acid.

DESCRIPTION OF GRAYSON COUNTY SOIL TYPES.

Houston Clay.—The soil of the Houston clay varies from a brownish gray to an almost white clay with an average depth of 8 inches. The darker colored areas occupy shallow depressions and the more level places, while the color of the soil on the slopes is usually of a lighter shade and from a distance sometimes appears to be almost pure white.

Partially decomposed limestone fragments are scattered over the surface and are generally most numerous on the knolls and slopes.

The subsoil of the Houston clay varies from a stiff brownish to a light gray clay, which becomes lighter as the depth increases, grading at from 20 to 30 inches into a white silty material composed of rather soft limestone. Below this, about 1 or 2 feet, is limestone hard enough to offer resistance to plant roots.

This type is a residual soil, and is rolling to rough and hilly in topography. The greater part of the type is found in the southeastern corner of the county along Cedar, Mill, Sister Grave, and other creeks. There are also areas in the southern and central parts of the county.

The surface of the soil is frequently badly eroded and broken by ledges of out-cropping limestone. Owing to these conditions, a very small percentage of the soil is cultivated.

When wet, the soil is very sticky, and bakes hard on drying. Where the topography is suitable, the soil gives good yields of corn, cotton, and oats. The productiveness of the soil varies widely in different areas, but on an average corn produces from 25 to 40 bushels, cotton from one-third to one-half bale, and oats from 35 to 50 bushels per acre.

These soils are high in lime, and well supplied with plant food. They will probably need crop rotation and nitrogen first of all.

Houston Black Clay.—The Houston black clay is composed of 10 to 15 inches of brownish black to jet black clay, resting on a subsoil very similar to the soil in texture and of dark gray color, frequently with a bluish tinge. The surface soil contains more organic matter than the subsoil and is less tenacious and impervious. Small lime concretions are mingled with both soil and subsoil, and a few fragments of limestone are occasionally found. This is one of the heaviest types in the county. It is sticky when wet and forms clods when plowed in this condition. These bake very hard and continued harrowing is necessary to put the fields in condition. However, when properly cultivated, the soil breaks up into small granules and has the appearance of black gravel and sand, a good seed bed being secured with comparatively little trouble.

Almost the entire area of the Houston black clay is adequately drained during years of normal rainfall. In topography the type varies from level to hill, the greater proportion being gently rolling. The hilly areas are found along the streams which flow in deep cut valleys, showing out-crops of the solid limestone.

The soil is a residual one and is derived from the Austin chalk and Taylor marl formations. It is naturally rich in humus. Practically all this type is found east of a north and south line passing through

Gunter and Southmayd, though there is one comparatively large area west of Gunter. Very little of it appears north of Sherman. It is found in large and uniform areas, the most conspicuous one extending south from Sherman through Howe and Van Alstyne and reaching the eastern limit of the county.

Practically all of the Houston black clay is under cultivation and is regarded as one of the most productive types in the area. General farm crops are suited to this type, and oats, cotton, corn and wheat are the principal crops. Cotton yields from one-fourth to three-fourths bale per acre, corn from 40 to 50 bushels, oats 40 to 60, and wheat 12 to 18 bushels. Many of the best farmers secure larger yields than those stated.

This soil is well supplied with lime and with plant food. Its need will probably be crop rotation.

Susquehanna Clay.—This soil consists of 4 inches or less of brown or reddish yellow fine sandy loam with a red to yellowish red sandy clay subsoil. This type is derived principally from the erosion of the Susquehanna fine sandy loam. The original timber growth was red oak, post oak, and blackjack oak. The land is difficult to handle where the clay lies near the surface. If plowed too wet it bakes very hard, and requires some time to get it back again into proper condition. The greater proportion of this type occurs in one large area about three miles southeast of Denison. It is found on land which is from hilly to rolling with occasional level areas on top of the hills. The land does not produce well at present.

It needs crop rotation, legumes, and probably phosphoric acid.

Susquehanna Fine Sandy Loam.—This soil consists of 5 to 15 inches of gray or reddish brown fine sandy loam, resting on a reddish yellow to red sandy clay, containing some iron concretions. The depth of the soil is variable, being shallower on knolls and slopes. It is found on rolling to rough and hilly land. The drainage is good. The land has been badly damaged by erosion. The largest body of this type occurs in the vicinity of Denison as a high broad ridge or broken ridges with a maximum width of five miles extending east and west. It also occurs in smaller spots in various portions of the county. Only a small portion of this soil is under cultivation. Where it is not too rolling or too badly eroded, it produces good yields of corn or cotton, but the average yields are 15 to 30 bushels of corn and about one-third bale cotton per acre. The soil responds well to fertilization. Orchards and small fruits and truck, such as cantaloupes, potatoes, and tomatoes, are grown to a certain extent on this land, and the soil also promises well as a peach soil.

This soil needs nitrogen, vegetable matter, crop rotation and phosphoric acid.

Wilson Clay Loam.—The surface soil consists of about 10 inches of a dark brown clay loam, underlaid to a depth of 30 inches with a stiff tenacious clay, varying from yellow to dark yellow in color. Lime

nodules are found in the subsoil and occasionally on the surface. This type is somewhat similar to the Houston black clay, but is not as dark as the Houston black clay and is less productive. The type is most largely found in the central western section of the county. The surface varies from rolling to almost level. Some of the more level areas are poorly drained during wet seasons. Corn yields 30 to 45 bushels, cotton one-third to one-half bale, and oats from 40 to 50 bushels per acre. The first need of this soil is legume rotation. Phosphates are also needed.

Wilson Clay.—The surface soil consists of 10 to 15 inches of very heavy clay, varying in color from a dull yellow to a dark brown or almost black. The subsoil is very similar to the soil in texture, but somewhat more tenacious. The soil is not uniform, as there are places where the fields appear to be striped alternately from yellow to dark, the stripes extending up and down the slope. This difference seems to be due to erosion and exposure of the yellow subsoil. Where the land has not been cultivated regularly the surface is frequently very uneven, owing to a succession of small depressions and knolls. Such land is known locally as hog wallow land. The darker colored phase of the soil is more fertile and more easily cultivated. The land is from rolling to level. The drainage under ordinary conditions is good, but in wet years crops are badly damaged by excess of moisture, especially on the level areas. The impervious subsoil permits little movement down through the soil. The greater proportion of the Wilson clay is found in one large body in the western part of the county. The area begins a little west of Southmayd and extends across the county line between Tioga and Gunter. It is about eighteen miles long and five miles wide. Corn produces 30 to 40 bushels, cotton one-third to one-half bale, oats from 35 to 55 bushels, and wheat from 12 to 15 bushels. The sample analyzed needs phosphoric acid, nitrogen, and rotation.

Miller Fine Sandy Loam.—The surface soil consists of a loose fine sandy loam, 12 to 20 inches deep with an average depth of 15 inches. The color for the most part is gray to reddish brown. The subsoil is similar in texture and structure but is lighter colored, and at the depth of about 30 inches a yellow sand is reached. The Miller fine sandy loam is a river deposit, and is not uniform in character. There are sometimes three terraces of this type of soil. The major portion of the type has good drainage, but there are some depressions where the soil is too wet for cultivation. These areas could be easily reclaimed by open ditches or by tile drains. The water table is generally found at the depth or 2 to 3 feet even in dry weather. It is a result of deposits laid down by the Red River. The original timber growth consists principally of cottonwood, ash, pecan and elm. This is a very fertile soil, well adapted to corn but suited also to the other crops grown in this locality. Corn yields from 30 to 40 bushels per acre and cotton about one-half bale. This soil is also well adapted to truck crops, such as potatoes, tomatoes, cabbage, and cantaloupe. Alfalfa

produces 4 to 5 tons per acre. Peanuts do well. This soil is well supplied with plant food. It will need rotation, with legumes first of all.

Grayson Clay Loam.—The surface soil consists of 8 to 10 inches of dark gray or brown loam with a stiff yellow clay or silty clay subsoil, sometimes mottled in color. This type of soil is known locally as flat and covers an area resembling an old lake bed about nine miles long and one and one-half miles wide, extending north and south between Southmayd and Gunter. The soil is flat and poorly drained, and most of it is uncultivated. The soil could be drained. The soil is well supplied with plant food.

Durant Fine Sand.—The surface soil consists of 3 to 4 inches of light gray fine sand with a reddish gray or yellowish gray fine sandy subsoil to a depth of 30 to 36 inches. It is found principally around Collinsville. The soil is probably formed by wind action. It occurs in small spots in the Susquehanna sandy loam and the Durant fine sandy loam. The soil is drifted by the wind, does not hold water, and is for this reason unproductive. It is also low in phosphoric acid and nitrogen.

Crawford Clay.—This is brown or chocolate colored clay soil 10 inches deep with a lighter colored stiff clay subsoil. It is found on slightly rolling to almost level areas. The drainage is good. Only a small area of this type is found about six miles southeast of Sherman. It is easily cultivated and produces well. Corn yields from 35 to 50 bushels, cotton one-half to three-fourths bale, oats 40 to 50 bushels, and wheat from 12 to 20 bushels per acre. The soil is well supplied with plant food. It would perhaps respond to acid phosphate in a good season.

Durant Loam.—This soil consists of 10 to 15 inches of dark gray or grayish brown loam surface soil with a somewhat heavier subsoil passing by degrees into a stiff brown or yellowish brown silty clay. It is found on areas that vary from almost level to slightly rolling. The drainage is good during an average year, but during wet seasons crops suffer to some extent from an excess of moisture on the level areas. A large area is found around Red Branch; other large areas are found in the vicinity of Whitesboro and Steedman. It is a productive soil, well adapted to corn, cotton, and oats. Corn yields from 35 to 45 bushels per acre, cotton about one-half bale, and oats from 35 to 50 bushels. This soil is well supplied with plant food. It will need crop rotation with legumes first.

Durant Fine Sandy Loam.—The surface soil is a fine textured sandy loam of a dark gray color and about 8 to 15 inches deep. The surface soil varies from dull yellow to brown, and is a sticky clay containing some fine sand. Both the soil and subsoil vary in color. The surface ranges from level to gently rolling and the level areas are darker and have a deeper color than the rolling areas. The soil has a tendency to drift. Large areas are found in the western part of the county north

and south of Whitesboro. The soil is easily cultivated, and well adapted to corn, cotton, oats, and fruit. It is a fine peanut soil and also produces truck well, including sweet and Irish potatoes and cantaloupes. Corn yields from 25 to 35 bushels, cotton about one-fourth bale, and peanuts from 35 to 50 bushels per acre.

This soil is fairly well supplied with plant food. It will probably need nitrogen and legume rotation first of all.

DESCRIPTION OF SAMPLES.

2834. Crawford clay: Brown or chocolate colored clay; 0"-8"; no rocks; taken five miles north of Howe.

2835. Subsoil to 2834: Chocolate colored, stiff clay; 8"-36".

2826. Durant fine sandy loam: Gray, fine sandy loam; 0"-18" depth; taken one and one-half miles southeast Whitesboro, Whitesboro Fruit Farm.

2827. Subsoil to 2826: Yellowish, mottled clay soil; 18"-36".

3355. Durant fine sandy loam: 0"-10"; W. A. Boaz's farm, three miles west of Whitesboro. Produces one-third bale cotton and 25 bushels corn; moderate.

3356. Subsoil to 3355: 10"-22".

2842. Durant fine sand: 0"-4"; three miles southeast of Denison; light gray; fine sand.

2843. Subsoil to 2842: 4"-36"; light gray, fine sand, slightly reddish tinge.

2822. Durant loam: 0"-10"; one and one-half miles south of Whitesboro, Whitesboro Fruit Farm; gray loam, high per cent silt.

2823. Subsoil to 2832: 12"-36"; yellowish mottled silty clay.

2946. Houston black clay: 0"-10"; seven miles southeast of Sherman; R. E. Fowler's farm; heavy black clay.

2947. Subsoil to 2946: 10"-36"; heavy black clay.

2840. Houston clay: 0"-8"; gray friable clay; seven miles southeast of Sherman.

2841. Subsoil to 2840: 8"-36"; yellowish clay, containing white spots.

2948. Houston clay: 0"-12"; gray friable clay; ten miles southeast of Sherman; Passel Head farm.

2944. Houston clay loam: 0"-12"; brown clay loam; five miles southeast of Sherman; Wm. Leslie's farm.

2945. Subsoil to 2944: 12"-36"; brown clay loam.

2836. Miller fine sandy loam: 0"-18"; grayish yellow sandy loam; one mile east of Cedar Mills; Allen Gudyer's place.

2837. Subsoil to 2836: Light reddish sandy clay; types get heavier as depth increases.

2838. Susquehanna clay: 0"-5"; reddish brown, heavy sandy loam; three and one-half miles southeast of Denison.

2839. Subsoil to 2838: 5"-36"; red sandy clay.

2824. Susquehanna fine sandy loam: 0"-15"; brownish gray, fine sandy loam; one mile north of Whitesboro; Harper's estate.

2825. Subsoil to 2824: 15"-36"; red sandy clay.

9335. Susquehanna fine sandy loam: 0"-6"; fertility moderate and uniform; upland; five miles east of Denison; F. M. Glothlin's farm.

9336. Subsoil to 9335: 6"-18".

2828. Wilson clay: 0"-6"; land used as meadow; one-half mile southwest of Pottsboro; J. T. Bryant's place.

2829. Subsoil to 2828: 5"-36".

2830. Wilson clay loam: 0"-10"; one-half mile southeast of Pottsboro; J. T. Bryant's farm; land in corn.

2831. Subsoil to 2830: 10"-36"; 4 per cent. gravel.

TABLE 2. COMPOSITION OF SOILS—GRAYSON COUNTY.

	Crawford Clay.		Durant Fine Sandy Loam.		Durant Fine Sandy Loam (probably).		Durant Fine Sand.		Durant Loam.	
	Surface 2834	Subsoil 2835	Surface 2826	Subsoil 2827	Surface 3355	Subsoil 3356	Surface 2842	Subsoil 2843	Surface 2822	Subsoil 2823
Percent.										
Phosphoric Acid.....	.11	.11	.05	.03	.04	.04	.02	.02	.04	.02
Nitrogen.....	.18	.10	.08	.09	.08	.07	.02	.04	.18	.08
Potash.....	.72	.78	.15	.34	.29	.39	.18	.07	.34	.23
Total Potash.....	.53	1.08	.66	.82	.48	.56	.32	.12	.88	.90
Lime.....	.93	.85	.19	.25	.24	.42	.13	.22	.41	.35
Magnesia.....	.05	.33	.15	.49	.16	.45	.11	.08	.58	.09
Alumina and Oxide of Iron.....	15.84	20.45	2.80	8.41	6.22	11.69	.95	1.14	8.90	4.16
Insoluble and Soluble Silica.....	69.38	62.51	94.31	84.55	87.69	78.25	97.99	98.88	80.33	89.00
Loss on Ignition.....	11.61	10.00	2.08	3.27	3.47	4.87	.70	1.26	6.66	3.93
Moisture.....	3.97	4.93	.69	2.81	1.59	3.95	.07	.05	2.67	1.80
Parts Per Million.										
Active Phosphoric Acid.....	29	.....	46	4	9	15	28	39	27	14
Active Potash.....	290	.....	93	116	97.7	99	56	46	199	79
Acidity.....	0	0	0	0	0	0	0	0	0	0

TABLE 2—Continued. COMPOSITION OF SOILS—GRAYSON COUNTY.

	Grayson Clay Loam.		Houston Black Clay.		Houston Clay.		Houston Clay.		Houston Clay Loam.	
	Surface 2832	Subsoil 2833	Surface 2946	Subsoil 2947	Surface 2840	Subsoil 2841	Surface 2848	Subsoil 2844	Surface 2844	Subsoil 2845
Percent.										
Phosphoric Acid.....	.07	.05	.12	.09	.21	.16	.10	.03	.02	
Nitrogen.....	.14	.05	.28	.14	.07	.05	.12	.12	.10	
Potash.....	.42	.22	.66	.60	.48	.33	.31	.24	.20	
Total Potash.....	.88	.33	1.02	.56	.36	.84	.58	.58	.54	
Lime.....	.65	.16	3.01	7.34	33.80	31.35	32.70	.59	.70	
Magnesia.....	.41	.16	.82	.85	.70	.80	.51	.29	.40	
Alumina and Oxide of Iron.....	7.25	6.35	15.60	15.82	7.63	8.99	5.5	8.62	11.25	
Insoluble and Soluble Silica.....	83.21	90.26	58.39	55.83	24.07	27.50	15.54	81.77	78.98	
Loss on Ignition.....	7.26	2.73	13.31	13.31	18.88	18.79	20.11	5.74	6.15	
Moisture.....	2.29	.74	13.13	5.80	2.69	3.05	1.99	2.65	2.93	
Parts Per Million.										
Active Phosphoric Acid.....	30	6	254	100	20	9	14	17.5	6.9	
Active Potash.....	190	99	379	180	114	100	86	175	133	
Acidity.....	.0	200	0	0	0	0	0	0	0	

TABLE 2—Continued. COMPOSITION OF SOILS—GRAYSON COUNTY.

	Miller Fine Sandy Loam.		Susquehanna Clay.		Susquehanna Fine Sandy Loam		Susquehanna Fine Sandy Loam.		Wilson Clay.		Wilson Clay Loam.	
	Surface 2836	Subsoil 2837	Surface 2838	Subsoil 2839	Surface 2824	Subsoil 2825	Surface 8335	Subsoil 9336	Surface 2828	Subsoil 2829	Surface 2830	Subsoil 2831
Percent.												
Phosphoric Acid.....	.06	.05	.05	.05	.04	.04	.05	.04	.02	.09	.04	.04
Nitrogen.....	.08	.05	.08	.06	.05	.07	.07	.05	.15	.07	.11	.13
Potash.....	.25	.43	.40	.60	.27	.33	.15	.22	.30	.44	.31	.29
Total Potash.....	1.24	1.06	.92	.64	.60	.72	.68	.....	1.44	1.36	.84	.84
Lime.....	.29	.16	.54	.28	.11	.26	.17	.....	.82	4.43	.37	.54
Magnesia.....	.16	.11	.24	.69	.35	.37	.14	.16	.38	1.27	.37	.31
Alumina and Oxide of Iron.....	3.34	7.10	10.05	15.63	3.55	10.15	4.45	8.93	18.17	17.68	6.63	8.78
Insoluble and Soluble Silica.....	93.53	89.00	80.11	70.62	93.43	83.06	91.15	84.41	62.10	56.29	83.98	81.62
Loss on Ignition.....	1.28	2.45	4.60	6.62	2.00	4.01	2.71	3.50	10.74	9.61	5.30	6.78
Moisture.....	1.49	1.40	2.91	3.23	.63	2.36	0.94	2.26	6.26	7.04	2.29	2.76
Parts Per Million.												
Active Phosphoric Acid.....	151	22	11	.....	19	7	16	8	18	154	19	13
Active Potash.....	291	.....	168	.....	105	118	161	81	308	233	151	169
Acidity.....	0	0	0	0	0	0	0	460	0	0	0	0

TABLE 3. INTERPRETATION OF SOIL ANALYSES OF GRAYSON COUNTY.

Type and County.	Phosphoric acid.	Potash.	Lime.	Corn possibility in bushels per acre for		
				Active phosphoric acid.	Active potash.	Total nitrogen.
Grayson County.						
Crawford clay.....	good	good	good	18	120	48
Durant fine sandy loam.....	fair	low	fair	30	37	23
Durant fine sandy loam (probably).....	good	good	good	6	37	23
Durant fine sand.....	low	good	good	12	37	8
Durant loam.....	good	good	good	18	80	48
Grayson clay loam.....	good	good	good	18	80	38
Houston black clay.....	good	good	high	50	157	48 +
Houston clay.....	good	good	high	45	80	23
Houston clay.....	good	good	high	12	37	28
Houston clay loam.....	low	good	good	12	80	33
Miller fine sandy loam.....	good	good	good	45	120	23
Susquehanna clay.....	good	good	good	12	80	23
Susquehanna fine sandy loam.....	fair	fair	fair	12	51	18
Susquehanna fine sandy loam.....	fair	fair	fair	12	80	23
Wilson clay.....	low	good	good	12	157	8
Wilson clay loam.....	good	good	good	12	51	33

TABLE 4. GROWN WITH FERTILIZER IN GRAYSON COUNTY SOIL. (WEIGHT IN GRAMS.)

Lab. No.	Addition.		KPN	KPNCa	KN	KP	PN
2826	Durant fine sandy loam.	Corn, 1910.....	48.5	30.0	16.5	6.5	36.7
		Corn, 1910.....	29.4			6.2	16.2
		Corn, 1911.....	50.1	49.5			25.2
		Corn, 1912.....	49.9			26.8	
		Sorghum, 1912.....	21.1			3.6	
		Corn, 1913.....	36.2			6.7	
2822	Durant loam.	Corn, 1910.....	41.0	42.0	20.2	37.5	36.5
		June corn, 1910.....	22.0				18.3
		Mustard, 1910.....	.7				.4
		Corn, 1910.....	57.3				44.7
2823	Durant loam subsoil.	Corn, 1912.....	60.1			25.0	
		Sorghum, 1913.....	23.0			2.2	
		Corn, 1912.....	40.4			5.4	
2946	Houston black clay.	Corn, 1910.....	24.1	15.8	16.5	23.1	19.2
		Sorghum, 1910.....	45.2				51.7
2947	Houston black clay subsoil.	Corn, 1910.....	34.5		3.0		21.0
		June corn, 1910.....	14.2		3.8		9.3
2948	Houston clay.	Corn, 1910.....	10.0	4.1	3.6	13.5	10.6
		Sorghum, 1910.....	47.4				43.0
		Oats, 1910.....	2.7				1.9
		Corn, 1911.....	33.0				24.5
		Corn, 1912.....	22.6				22.0
		Sorghum, 1912.....	15.2				13.0
2944	Houston clay loam.	Corn, 1910.....	43.0	40.0	38.2	13.0	43.0
		Sorghum, 1910.....	44.7		40.2	8.0	41.4
		Corn, 1912.....	58.1		17.6		
		Sorghum, 1912.....	24.7		17.0		
		Corn, 1913.....	45.2		20.2		
		Sorghum, 1913.....	25.2		6.6		
		Corn, 1914.....	37.5		10.0		
2945	Houston clay loam, subsoil.	Sorghum, 1914.....	30.7		7.5		
		Corn, 1910.....	43.0	37.0	4.0		
		Oats, 1910.....	0.7	0.8	0.8		
2824	Susquehanna fine sandy loam.	Corn, 1911.....	49.0	45.5	6.9		
		Corn, 1910.....	38.5	2.80	7.7	4.1	26.3
		June corn, 1910.....	25.8				18.7
		Corn, 1913.....	27.2			19.7	
		Sorghum, 1913.....	29.5			3.9	
		Corn, 1914.....	36.4			10.0	
		Sorghum, 1914.....	27.5			4.4	

TABLE 4. GROWN WITH FERTILIZER IN GRAYSON COUNTY SOIL. (WEIGHT IN GRAMS.)

Lab. No.	Addition.		KPN	KPNCa	KN	KP	PN
2825	Susquehanna fine sandy loam. subsoil.	Corn, 1910....	34.0		3.0		27.5
		June corn, 1910	27.2				21.2
		Corn, 1911....	37.3				30.0
9336	Susquehanna fine sandy loam, subsoil.	Corn, 1915....	34.7				31.0
2828	Wilson clay.	Corn, 1910....	25.5	23.0	7.0	28.7	28.5
		June corn, 1910	16.2		5.7	7.3	19.0
		Corn, 1911....	37.0				33.0
		Corn, 1914....	22.6		11.9		
		Sorghum, 1914.			21.5		
		Corn, 1915....	54.3		24.3		
2829	Wilson clay, subsoil.	Corn, 1910....	16.5		6.5	14.0	18.0
		June corn, 1910	11.7		4.4	3.5	10.5
		Corn, 1911....	30.7				29.5
		Sorghum, 1911.	9.5				8.3
2830	Wilson clay loam.	Corn, 1910....	45.5	11.0	13.0	20.0	37.7
		June corn, 1910	22.7				15.9
		Corn, 1911....	39.9				33.2
		Corn, 1912....	43.4		44.6		
		Sorghum, 1912.	19.3		19.0		
2831	Wilson clay loam, subsoil.	Corn, 1910....	42.0		9.5	15.0	39.0
		June corn, 1910	15.3				10.2
		Corn, 1913....	53.0			10.9	
		Sorghum, 1913.	25.7			2.5	
		Corn, 1914....	28.5			5.6	
		Sorghum, 1914.	32.0			2.9	
		Corn, 1915....	31.5			5.8	

SOILS OF LEE COUNTY.

Lee county is in the Gulf Coastal Plain and has an area of approximately 700 square miles. The mean altitude is 400 feet. It is inclined to the southeast and north and has a general slope of about four feet to the mile. Ten different types have been mapped by the Bureau of Soils. These are shown in Table 5.

TABLE 5. SOIL SURVEY OF LEE COUNTY.

Areas of Different Soils.

Soil.	Acres.	Per cent.
Lufkin fine sandy loam.....	113,152	26.6
Orangeburg fine sand.....	96,698	16.4
Orangeburg fine sandy loam.....	57,920	13.6
Lufkin gravelly loam.....	47,360	11.1
Norfolk fine sand.....	41,856	9.8
Houston black clay.....	38,208	8.9
Sharkey clay.....	28,096	6.6
Meadow.....	13,760	3.2
Orangeburg clay.....	10,688	2.5
Lufkin loam.....	5,376	1.3
Total.....	426,112	

With the exception of the Houston black clay, the soils of this area are low in active phosphoric acid, and seem to need fertilization with acid phosphate. They also need crop rotation, including legumes to secure nitrogen from the air. None of these samples tested for acidity

were found to be acid. Nitrogen, crop rotation, and acid phosphate, seem to be the chief needs of the soils of this area. This is also shown in the pot experiments.

DESCRIPTION OF THE SOIL TYPES OF LEE COUNTY.

Lufkin Fine Sandy Loam.—The Lufkin fine sandy loam is generally light in texture, and gray to dark gray in color. The type varies in depth from 3 inches on hillsides to 20 inches, but averages about 15 inches. The subsoil of this type is a stiff sandy clay, varying from 3 to 36 inches in depth and gray to dark gray in color. During the dry seasons the subsoil cracks deeply unless covered by a good depth of soil.

This soil has great water holding capacity, but capillarity works very rapidly and crops frequently suffer unless due care is exercised in the preservation of the moisture. The Lufkin fine sandy loam is the predominating type of the southeastern part of the county.

The drainage is generally good, although some of the land must be drained in order to produce good crops.

Only a small part of this type is cultivated, corn and cotton being the principal crops. From 15 to 20 bushels of corn and one-fourth to one-half bale of cotton are the average yields per acre. The soil needs phosphoric acid, nitrogen, and legume rotation.

Houston Black Clay.—The Houston black clay varies from a heavy loam to a clay loam or clay, and is known as "waxy clay land" by the farmers. The soil is from 3 to 12 inches deep, and it has great water holding capacity. It cracks badly in dry season. The soil is dark to dark brown in color.

The subsoil is a dark heavy clay varying in depth from 10 inches to 3 or 4 feet. The soil forms a belt running northeast and southwest across the county at the center. The drainage is generally good. This soil has been cultivated for a number of years to corn, cotton and oats. Under favorable conditions corn produces 50 bushels and cotton from one-half to one bale per acre. This soil is well supplied with plant food. It will need crop rotation with legumes first.

Orangeburg Fine Sandy Loam.—This soil is from 6 to 15 inches deep, and is covered by a forest growth of post and blackjack oaks. It is a medium to fine sand, reddish brown to gray in color and does not contain much organic matter. Most of the area occupied by this type is still virgin.

The subsoil is a red sandy clay, usually more than three feet deep. Most of this soil is found in the northern part of the county and some in the extreme western part. The drainage is everywhere very good.

Cotton and corn are the principal crops, 30 to 40 bushels of corn and one-half to three-fourths of a bale of cotton being produced per acre. The sample examined is low in phosphoric acid.

Lufkin Loam.—The Lufkin loam is from 3 to 10 inches deep, grading from a heavy loam to a fine sandy loam, is dark in color, and contains

a fair amount of organic matter. It is easily puddled. The subsoil is a stiff, compact, dark colored clay. This soil lies principally three miles east of Giddings on both sides of the Houston & Texas Central Railroad. The drainage is poor and during wet seasons crops suffer from standing water.

Corn and cotton are the principal crops, corn producing from 25 to 35 bushels per acre, and cotton from one-fourth to three-fourths bale per acre.

Norfolk Fine Sand.—The Norfolk fine sand is a fine loose coarse soil, always over three feet deep, with little or no difference between the soil and subsoil. Only a small percentage of the total area has been cleared. The largest continuous areas of this type are found in the extreme northern part of the county. The soil is everywhere rolling and the drainage is perfect. The soil is considered of little agricultural value and only a small area is planted to crops. When first cleared it yields fair crops of cotton, but corn makes only an indifferent growth. The sample examined is low in phosphoric acid and nitrogen. It needs a legume rotation.

Orangeburg Fine Sand.—This soil is a loose, incoherent, medium to fine sand, varying in depth from 18 to 36 inches, and gray to yellowish gray in color. The subsoil is nearly all a red sandy clay.

This type is located mostly in the northern and western part of the county, although narrow strips are found in the south. The surface of this soil is always rolling and the drainage is almost perfect. The crops grown are cotton and corn, the yields being one-third to one-half bale of cotton and 25 to 30 bushels of corn per acre, when the land is fresh. The humus is soon exhausted from this soil. The sample examined is low in active phosphoric acid.

Orangeburg Clay.—The Orangeburg clay is from 3 to 10 inches in depth, is a red heavy sandy loam to a loam, and usually contains much organic matter. The subsoil usually extends to a depth of more than 36 inches. Most of this soil lies in the northern part of the county. The surface is rolling and the drainage is good. Corn yields from 30 to 40 bushels per acre, and cotton from one-half to three-fourths of a bale per acre. Most of the soil is under cultivation, some of it is in meadow and good crops of Johnson grass hay are secured. The sample is low in phosphoric acid, but well supplied with nitrogen.

Sharkey Clay.—This soil is from 10 to 20 inches deep and is usually a heavy yellowish gray to dark gray clay. The subsoil grades from a dark stiff heavy clay to fine yellow sand. This type is found along the lower courses of the larger streams north of Giddings; it is generally level and subject to annual overflow. The soil would profit by both surface ditches and tile drains.

Only the lighter phases of this type are under cultivation. Cotton produces a bale per acre, and corn 50 bushels. Floods, however, are yearly expected and crops are frequently lost.

Meadows.—The meadow varies in depth and texture of soil, from 10 to 24 inches deep and contains a fair amount of organic matter. The surface soil is a gray to a dark gray fine loamy sand. The subsoil is similar to the surface but usually contains more clay than the latter. The meadow is found along almost all the smaller streams; it is nearly all level enough to plow. It is easily tilled and most of the land is under cultivation. The average yields are 20 bushels of corn and one-third bale of cotton per acre.

TABLE 6. COMPOSITION OF SOILS—LEE COUNTY.

	Houston Black Clay.		Lufkin Fine Sandy Loam.		Lufkin Fine Sandy Loam.		Norfolk Fine Sand.		Norfolk Fine Sand (probably).	
	Surface 3633	Subsoil 3631	Surface 3631	Subsoil 3632	Surface 3974	Subsoil 3975	Surface 3652	Subsoil 3653	Surface 4289	Subsoil 4290
Percent.										
Phosphoric Acid.....	.08	.07	.04	.05	.03	.02	.01	.03	.02	.02
Nitrogen.....	.06	.05	.06	.06	.05	.04	.02	.04	.04	.03
Potash.....	.99	1.05	.19	.39	.19	.13	.05	.04	.13	.25
Total Potash.....					.70	.59	.63	.62		
Lime.....	.98	.80	.59	.53	.39	.14	.15	.11	.20	.19
Magnesia.....	.30	.32	.16	.43	.15	.14	.11	.07	.15	.09
Alumina and Oxide of Iron.....	18.80	18.65	3.09	11.64	1.72	3.61	1.23		1.15	4.31
Insoluble and Soluble Silica.....	64.24	65.91	91.93	76.22	94.27	92.77	97.35		96.53	91.91
Loss on Ignition.....	7.02	6.70	2.17	4.99	1.74	1.86	.95	.40	1.30	1.55
Moisture.....	6.10	7.23	1.26	5.69	.85	1.22	.23	.29	.36	1.07
Parts Per Million.										
Active Phosphoric Acid.....	66	56	95	9	18	6	5	11	21	11
Active Potash.....	259	243	299	310	135	81	74	52	106	93
Acidity.....			0	0	0	0	200		0	

TABLE 6—Continued. COMPOSITION OF SOILS—LEE COUNTY.

	Orangeburg Clay.		Orangeburg Fine Sand.		Orangeburg Fine Sand (probably).		Orangeburg Fine Sandy Loam.	
	Surface 3662	Subsoil 3663	Surface 3654	Subsoil 3655	Surface 4326	Subsoil 4327	Surface 3656	Subsoil 3657
Percent.								
Phosphoric Acid.....	.13	.11	.02	.02	.04	.05	.02	.02
Nitrogen.....	.13	.11	.02	.02	.05	.06	.02	.03
Potash.....	.33	.30	.03	.07	.28	.42	.02	.19
Total Potash.....	.57	.67	.71	.73	.....	.....	.53	1.18
Lime.....	.26	.30	.20	.18	.15	.21	.07	.23
Magnesia.....	.30	.26	.17	.13	.17	.26	.15	.19
Alumina and Oxide of Iron.....	17.95	17.94	1.08	.99	6.20	14.12	.96	6.82
Insoluble and Soluble Silica.....	69.74	69.87	97.53	97.71	89.60	77.04	97.60	87.60
Loss on Ignition.....	7.56	6.92	.85	.58	1.55	3.63	.66	2.31
Moisture.....	3.46	3.43	.16	.26	1.52	4.26	.19	1.68
Parts Per Million.								
Active Phosphoric Acid.....	9	10	6	6	5	3	13	7
Active Potash.....	242	154	98	92	181	176	66	86
Acidity.....	0	0	0	0	0	0	0	0

DESCRIPTION OF SAMPLES.

3633. Houston black clay: 0"-12"; good soil, rolling; cracks on drying; washes; three miles west of Lexington; C. H. Taylor's farm; produces 30 bushels corn; one-third bale cotton.

3634. Subsoil to 3633: 12"-24"; black.

3631. Lufkin fine sandy loam: 0"-6"; moist in dry season; does not wash; crumbles; one and one-half miles southwest of Giddings; moderate, upland; 25 years in cultivation; 8 tons of barnyard manure to acre; produces 1200 pounds seed cotton, 45 bushels corn.

3632. Subsoil to 3631: 6"-12".

3974. Lufkin fine sandy loam: 0"-12"; brown loam; moderate, rolling; one mile southwest of Giddings; O. D. Hurst's farm; 20 years in cultivation; 12 tons manure; good results; crops, cotton and peanuts.

3975. Subsoil to 3974: 12"-24"; brown to black clay loam.

3652. Norfolk fine sand: 0"-12". Packs, does not wash; Louis Gest's farm, two miles west of Lexington; not in cultivation.

3653. Subsoil to 3652: 12"-24".

4289. Norfolk fine sand: 0"-6"; light, sandy; moderate, upland, rolling; five miles northwest of Lexington; W. D. Plant's farm; holds moisture well in dry season; under drains well in wet season; does not pack, crack or wash; crumbles; two years in cultivation; crops, corn, cotton, cowpeas; 20 bushels corn, one-half bale of cotton.

4290. Subsoil to 4289. 6"-13"; light, sandy.

3662. Orangeburg clay: 0"-18"; red, little sticky when wet; does not wash; cracks some on drying; Jno. Mundin's farm, one-half mile east of Lexington; 30 years in cultivation; produces three-fourths bale cotton, 50 bushels corn.

3663. Subsoil to 3662: 18"-30".

3654. Orangeburg fine sand: 0"-12"; good rolling soil; does not pack or run together; holds moisture; two miles west of Lexington; Louis Gest's farm; 25 years in cultivation; produces 20 bushels corn, one-half bale cotton, 100 bushels potatoes.

3655. Subsoil to 3654: 12"-24"; behaves well in wet weather; have used fertilizers with good results.

4226. Orangeburg fine sand: 0"-5"; red, sandy; L. L. Sealy's farm, two and one-half miles southwest of Tanglewood; moderate, upland; does not crack, pack, or wash; crumbles; 60 to 70 years in cultivation; produces 15 bushels corn.

4227. Subsoil to 4226: 5"-18"; red, sandy.

3656. Orangeburg fine sandy loam: 0"-12"; holds moisture well; does not crack on drying; no clods; two miles east of Lexington; Louis Gest's farm; cotton will not grow, probably root rot; produces 25 bushels corn, 2 tons cane, 100 bushels potatoes; have used barnyard manure with good results.

3657. Subsoil to 3656: 12"-24"; good soil.

TABLE 7. INTERPRETATION OF SOIL ANALYSES OF LEE COUNTY.

Type and County.	Phosphoric acid.	Potash.	Lime.	Corn possibility in bushels per acre for		
				Active phosphoric acid.	Active potash.	Total nitrogen.
Houston black clay.....	good	good	good	35	120	18
Lufkin fine sandy loam.....	good	good	good	40	80	18
Lufkin fine sandy loam.....	low	good	good	12	51	18
Norfolk fine sand.....	low	low	good	6	37	8
Probably Norfolk fine sand.....	low	good	good	18	37	13
Orangeburg clay.....	good	good	fair	6	80	38
Probably Orangeburg fine sand.....	low	low	good	6	37	8
Orangeburg fine sand.....	fair	good	good	6	80	18
Orangeburg fine sandy loam.....	low	low	low	12	37	8

TABLE 8. GROWN WITH FERTILIZER IN LEE COUNTY SOIL. (WEIGHT IN GRAMS.)

Lab. No.	Addition.	KPN	KPNCa	KN	KP	PN
3633	Houston black clay. Sorghum, 1910.	18.1	30.9	2.0	3.5	22.5
	Mustard, 1910.	1.8	5.1			5.0
	Corn, 1911.	36.7	65.6			52.2
	Corn, 1913.	11.0			10.7	
	Sorghum, 1913.	34.8			3.3	
	Corn, 1914.	33.2			5.0	
	Sorghum, 1914.	25.2			2.2	
	Corn, 1915.	23.3			4.5	
3634	Houston black clay. Sorghum, 1910.	10.2	11.7	1.4	3.0	.82
	Mustard, 1910.	4.1			3.3	
	Corn, 1911.	33.7				29.2
3631	Lufkin fine sandy loam. Sorghum, 1910.	50.9	53.7	41.5	15.2	47.9
	Mustard, 1910.	4.8	8.0	4.5	2.7	4.3
	Corn, 1911.	37.2	42.5	11.5	7.5	32.6
3632	Lufkin fine sandy loam. Sorghum, 1910.	45.3		7.7	17.9	42.9
	Mustard, 1910.	2.2		1.6	0.7	4.5
	Corn, 1911.	43.3		5.4	6.1	42.6
	Corn, 1913.	14.6			9.9	
	Sorghum, 1913.	35.9				
	Corn, 1914.	35.5			4.8	
	Sorghum, 1914.	25.9			1.4	
	Corn, 1915.	29.0			3.9	
3974	Lufkin fine sandy loam. Oats, 1910.	12.5	17.8	6.3	6.3	16.2
	Corn, 1911.	40.5	34.0	5.9	6.6	27.0
3975	Lufkin fine sandy loam. Oats, 1910.	11.2	14.2	3.3	3.0	12.2
	Corn, 1912.	43.6		48.6		
	Sorghum, 1912.	28.3		23.5		
3662	Orangeburg clay. Corn, 1910.	24.5	20.9	17.9	21.3	26.0
	Mustard, 1910.	5.1	2.8	2.0	1.7	0.2
	Corn, 1911.	49.3	51.3	35.8	12.8	49.2
3663	Orangeburg clay. Corn, 1910.	20.2	16.8	4.4	15.4	22.2
	Mustard, 1910.	3.3	6.2	2.2	1.0	2.2
	Corn, 1911.	47.9	48.0	15.0	9.7	44.8
3654	Orangeburg fine sand. Corn, 1910.	22.5	17.2	3.3	5.0	19.3
	Oats, 1910.	10.8				10.0
	Corn, 1911.	45.5				31.1
3655	Orangeburg fine sand. Corn, 1910.	29.5	30.0	3.5	2.2	25.0
	Oats, 1910.	4.2				2.7
	Corn, 1911.	47.8				29.6
	Corn, 1913.		6.9	7.4		
	Sorghum, 1913.		6.4	7.0		
	Corn, 1914.		3.5	4.0		
	Corn, 1913.		25.4	31.4		
	Sorghum, 1913.		23.0	25.3		
	Corn, 1914.		8.4	3.5		
	Sorghum, 1914.		4.4	2.2		
	Corn, 1915.		3.7	1.9		
	Sorghum, 1914.		16.9	17.0		
	Corn, 1915.		9.0	5.8		

TABLE 8—Continued. GROWN WITH FERTILIZER IN LEE COUNTY SOIL.
(WEIGHT IN GRAMS.)

Lab. No.	Addition.		KPN	KPNCa	KN	KP	PN
3656	Orangebury fine sandy loam.	Corn, 1910....	20.4	19.7	5.7	6.2	19.7
		Oats, 1910....	6.7				6.2
		Corn, 1911....	50.1				32.3
		Corn, 1914....	39.5		3.57		
		Sorghum, 1914.	26.0		6.9		
		Corn, 1915....	39.4		8.6		
3657	Orangebury fine sandy loam.	Corn, 1910....	17.9	22.0	2.0	3.0	21.0
		Oats, 1910....	10.7				9.5
		Corn, 1911....	41.0				28.5
		Corn, 1913....	15.8			10.2	
		Sorghum, 1913.	27.9			1.5	
		Corn, 1914....	40.8			4.0	
		Sorghum, 1914.	33.3			1.3	
		Corn, 1915....	24.9			1.7	

SOILS OF McLENNAN COUNTY.

The area mapped in this survey occupies 490 square miles, of which about 440 miles are in McLennan county and 50 square miles in the northwest part of Bosque county. The greater part of the area on both sides of the Brazos River consists of rolling upland prairie, intersected by numerous small streams and rivers. The prairies have a gentle slope toward the Brazos River. The topography is rough and broken along the small streams and rivers which traverse the prairies of the western section of the area, and the soils here suffer from erosion, which causes them to be shallow, stony, and of low agricultural value. A considerable portion of this area consists of soil deposited by the Brazos River. Sixteen types of soil were mapped in the area. Table 9 shows the area embraced by each type in the locality.

TABLE 9. SOIL SURVEY OF WACO AREA.

Areas of Different Soils.

Soil.	Acres.	Per cent.
Crawford clay.....	112,320	35.5
Houston black clay.....	57,280	18.1
Crawford stony clay.....	27,264	8.6
Susquehanna fine sandy loam.....	24,512	7.7
Miller fine sandy loam.....	22,208	7.0
Yazoo heavy clay.....	13,248	4.2
Houston clay.....	12,864	4.0
Travis gravelly loam.....	12,416	3.9
Houston loam.....	8,840	2.7
Yazoo clay.....	7,488	2.4
Crawford loam.....	6,784	2.2
Miller heavy clay.....	4,808	1.5
Rock outcrop.....	2,880	0.9
Houston gravelly clay.....	1,984	0.6
Miller fine sand.....	1,408	0.4
Miller silt loam.....	960	0.3
Total.....	316,864	.....

The soils of this area are generally well supplied with phosphoric acid, although a few of the samples were somewhat low in this respect. They are also well supplied with nitrogen, although there are a larger

number of these soils which are low in nitrogen. They are well supplied with potash. The soils range from fair to good in lime. The principal need of this area appears to be a rotation of crops, which includes legumes to be turned under or grazed off for the purpose of maintaining the supply of nitrogen and adding vegetable matter to the soil. Such a rotation is essential to the proper maintenance of fertility. In connection with this rotation some phosphate would be of advantage on most of the soils, although, as stated, these soils are well supplied with available phosphoric acid as a rule.

DESCRIPTION OF SOIL TYPES OF MCLENNAN COUNTY, WACO AREA.

Houston Black Clay.—This soil is known locally as black waxy prairie land, and is very productive. It is a black sticky clay, sticky and tenacious when wet, but friable and loamy when in a well cultivated condition. The soil grades at about ten inches into a stiff dark drab to slate colored clay, becoming stiffer, heavier, and a little lighter in color as the depth increases.

The largest unbroken tract of this soil lies to the south and southwest of Waco, but it occurs in bodies of more or less extent throughout the county.

The topography is rolling, the soil has good natural drainage, and can be cultivated in a comparatively short time after a rain.

The greater part of this type is derived from the weathering of the Taylor marl formation, a compact, massive, calcareous clay.

The Houston black clay is well adapted to general farming and produces well, suffering very little from drouth. Oats, wheat, and corn are nearly always profitable. Cotton produces from one-half to three-fourths of a bale per acre, corn gives a yield of 30 to 35 bushels per acre, wheat 15 bushels, oats 35 to 50 bushels per acre. The soil is considered best adapted to cotton and grain.

Yazoo Clay.—This soil is a black or dark brown clay loam with an average depth of 8 to 10 inches. On drying it cracks and a lighter colored crust forms. The soil becomes darker, stiffer, and heavier as the depth increases. The type occurs along the valleys of the north and south forks of the Bosque River and reaches the greatest extent between the junction of these streams and the mouth of the Brazos River. The topography is generally level, with a general slope towards the stream. The greater proportion of the type is not subject to overflow and is usually well drained.

The Yazoo clay is an alluvial soil, and one of the strongest and most productive soils in the county. Cotton yields from one-third to one-half bale per acre, even when damaged by the boll weevil. Corn yields 35 to 40 bushels per acre, oats from 35 to 50 bushels, and wheat, which is grown very little, yields from 12 to 15 bushels per acre. Alfalfa does well, and millet, sorghum, onions, and potatoes are grown with excellent results. This soil is well supplied with plant food.

Yazoo Heavy Clay.—The Yazoo heavy clay is a dark drab to black clay, having an average depth of about 10 inches, and grading into a subsoil of slightly lighter color but stiffer and more tenacious. If this soil is plowed when in a wet condition the clods become very hard and baked, making it difficult to get the soil in a suitable condition for the cultivation of crops and lessening its productivity in no small degree.

The largest areas of the type occupy valleys of the Tehucan and Aquilla creeks. The topography is comparatively level, and the land is generally well drained. The Yazoo clay is of alluvial origin, is subject to overflow, and is very productive. With careful management it gives large yields of cotton, corn, oats, and forage crops. Corn and cotton are the principal crops. Before the advent of the boll weevil this soil yielded three-fourths to one bale per acre; at present the yield is one-half bale per acre. Corn gives an average of 35 to 40 bushels per acre. Wheat is seldom grown on account of the danger of overflow.

Miller Fine Sand.—This is a loose gray to white, fine to medium sand, which grades at 12 to 15 inches into a sand of about the same texture, but of a slightly brown or yellowish color and extending to a depth of 4 to more than 6 feet. The largest area of this soil occupies a ridge on the eastern side of the Brazos in the northern part of the county. The soil is of little agricultural value and is not cultivated to any extent. Cotton and corn sometimes give fair yields in wet seasons.

Susquehanna Fine Sandy Loam.—The Susquehanna fine sandy loam is a gray to very light brown fine sandy loam, averaging in depth from 10 to 12 inches. The subsoil is a heavy red to reddish brown sandy clay. The soil becomes stiffer as the depth increases.

The largest areas of this type are scattered over that section of the area surveyed which lies east of the Brazos River. The topography is rolling, the drainage good.

A comparatively small proportion of this type is under cultivation, the remainder being covered by a heavy growth of post oak. The Susquehanna fine sandy loam is locally known as "post oak land" and is not considered a strong soil. The crops usually suffer from lack of moisture in seasons of average rainfall, and are, as a rule, a failure during a dry season. Profitable yields are always obtained in wet seasons. The soil warms up quickly in the spring and is, therefore, well suited to crops which mature before the hot dry months of late summer. Peaches, pecans, pears, and small fruits do well on this soil. Oats yield 25 bushels, corn 20 bushels, and cotton one-fourth bale per acre. Larger yields are produced in wet years. This soil is well supplied with plant food, except nitrogen. It needs legume crop rotation.

Miller Fine Sandy Loam.—The surface soil of this type is mellow, friable and easily tilled, with a depth varying from 12 to 24 inches. The surface soil is brown to grayish brown and from fine to very fine sand and silt. The subsoil is a red sticky sandy clay.

The Miller fine sandy loam is found only along the Brazos River

and is the principal bottom type of the county. The main bodies are found in the bends of the river, the largest near Waco and Patrick. The surface of this type is terraced and each terrace is nearly level.

The Miller fine sandy loam can be worked much sooner after a rain than any other soil in the county except Miller fine sand. Water penetrates easily, but is held in the subsoil and a large percentage of the rainfall is conserved. The drainage is good except in a few local spots, which could be easily drained by open ditches, or closed tile drains.

The Miller fine sandy loam is a deposit laid down by the Brazos River in times of flood and belongs to the present geological time. Along the lower terraces, which are overflowed, it is still in the process of formation.

This soil seems well adapted to the growing of garden truck. Peaches, pears, plums, blackberries, etc., do well also. Cotton is the chief crop grown at present, and yields from one-third to two-thirds bale per acre. Prior to the advent of the boll weevil the soil yielded three-fourths to one bale per acre. In favorable seasons corn yields 50 to 60 bushels per acre, the average, however, being from 20 on the poorest tracts, to 35 on the best. Alfalfa does well when once established. One sample of this soil is well supplied with potash and phosphoric acid, though low in nitrogen. The other sample is low in phosphoric acid and nitrogen.

Travis Gravelly Loam.—The surface soil of this type, to a depth of about 10 inches, consists of a medium to a fine sand or sandy loam, and is a gray to a grayish brown in color. The subsoil (10"-36") is a mass of coarse sand and small rounded gravel, in a matrix of stiff, heavy, red clay.

The largest body of this soil lies east of Elm creek, extending from the northern border of the area surveyed to the vicinity of the mouth of Whiterock creek. Another area of considerable size is found east of Whiterock creek at Ross.

The topography is undulating to quite rolling and the drainage is excellent on the greater part of the areas. In some localities, notably in the vicinity of Ross, open ditches would be of much value.

The Travis gravelly loam is adapted to the production of peaches, pears, plums, berries, etc. Cotton averages one-third bale per acre, corn from 25 to 30 bushels per acre, and oats from 35 to 40 bushels per acre. All crops do much better in wet seasons. This sample of this soil is low in nitrogen. It needs legume crop rotation.

Houston Clay.—This type is a dark brown to black clay with an average depth of about 10 inches. The surface is friable and easily cultivated, but becomes baked and cracked in areas not cultivated.

The subsoil is a stiff clay, of somewhat lighter color than the surface, and contains small fragments of limestone. Under the subsoil is a layer of rotten limestone or chalk, and on many of the slopes erosion has caused this limestone to appear at the surface.

The main body of this type occurs in a strip extending from the

Brazos River, north of Waco, in a southwest direction to the southern boundary of the area.

The topography of the Houston clay is rolling and the soil is well drained. The soil is formed by the weathering of the Austin chalk. Cotton usually matures earlier on the Houston clay than on the Houston black clay, the average yield being from one-third to one-half bale per acre. Corn yields better in wet seasons, but the average under ordinary conditions lies between 20 and 25 bushels per acre. Millet, sorghum, and wheat are also grown.

Houston Gravelly Clay.—This type is a heavy dark drab or black clay loam containing a large quantity of small rounded gravel, varying in size from the coarse sand to pebbles 2 or 3 inches in diameter. At 10 inches below the surface the soil becomes a stiff dark drab to dark brown clay, much lower in gravel content. This soil is of very limited extent, and occurs in the vicinity of Elm Matt and Ross.

Crops do not yield as well on the Houston gravelly clay as on Houston black clay or "black land." Oats are a surer crop than corn and yield about 30 bushels per acre. They are best sown in the fall. Corn averages 20 bushels per acre, and cotton one-fourth bale. The effect of drouth is much more marked than on the heavier "black land."

Houston Loam.—The typical soil of the Houston loam is a gray to light brown loam from 10 to 12 inches deep, containing a large amount of silt. The subsoil is a drab to slate colored silty clay, which also contains a large amount of sand. The subsoil becomes heavier as the depth increases.

The Houston loam occurs in irregular shaped areas of varying extent in the northeastern part of the county surveyed. The topography is gently rolling and the drainage is generally good.

The greater part of the material forming the type consists of a combination of a fine sand alluvial deposit and the heavier material composing the black prairie soil.

The Houston loam is better adapted to the earlier maturing crops, as the drouths of the late summer seriously affect the yields. Cotton produces from one-third to one-half bale per acre, corn about 25 bushels, oats about 35 bushels, and wheat (rarely grown) from 10 to 12 bushels per acre. Sorghum is grown with good results. In general, crops grown on this type are subject to serious damage from drouths, but during favorable seasons fair yields are always obtained. This soil needs nitrogen and legume crop rotation.

Crawford Clay.—The Crawford clay is one of the most important types found in the area. The soil averages 8 to 10 inches in depth and consists of a brown, slightly reddish clay, which is stiff and tenacious when wet, but friable and granular when dry and in a well cultivated condition. The subsoil (10"-36") is a stiff tenacious clay of a lighter reddish brown color, which becomes stiffer and more compact as the depth increases.

The Crawford clay occurs in large unbroken areas occupying almost

all the gently rolling area and more level sections of the prairie in the western half of the area surveyed. The whole section is a gently rolling upland plateau. The soil is excellently drained, yet it holds water well enough to produce in an average season all the crops grown.

A large proportion of the grain produced in the county is grown on this soil and it is well adapted to corn and oats. Oats yield 30 to 40 bushels per acre and wheat 15 bushels in an average year. Corn is seldom a failure and will average from 10 to 15 bushels in a dry year and 30 to 40 bushels in a wet season. Cotton averages one-third bale per acre, but in a favorable season and when well cultivated, three-fourths to one bale per acre has been obtained. Millet, rye, sorghum, plums, and peaches are successfully grown. This soil is well supplied with plant food.

Crawford Stony Clay.—This soil is of little importance both in extent and agricultural value. It is a dark reddish brown clay, carrying limestone fragments, and is very shallow, the underlying limestone occurring at depths varying from 12 to 20 inches. The topography is very rolling and the area is well drained; the soil is so shallow and stony that very little moisture is conserved.

The Crawford stony clay is formed from the weathering of the Fort Worth limestone.

The areas covered by this type are not suited to cultivation, but they support an excellent growth of native grasses and are used almost exclusively as pasture lands. Small areas that are comparatively free from stones are sometimes cultivated, and if there is an abundance of rainfall during the growing season a fair crop is secured. Under these conditions the average yields are: corn, 15 bushels; wheat, 6 bushels; oats, 20 bushels, and cotton, one-sixth to one-fifth bale per acre.

Crawford Loam.—The soil of this type is about 12 inches deep, and is a brown to reddish brown loam, containing a relatively large percentage of silt and fine sand. The subsoil is a heavy brown loam, grading at 20 to 25 inches into a stiff reddish compact sandy clay. The principal area occurs north of the Bosque River and southeast of the China Spring. The topography is rolling but there is no serious erosion, and the soil is well drained. The soil is easy to cultivate, and can be worked very shortly after heavy rains.

The Crawford loam is formed from the weathering of the sandy ferruginous clays, impure limestone, and sandstone, which compose the geological formation.

The soil is well suited to the cultivation of cotton, corn, fruits, and also produces fair yields of wheat and oats. Small fruits and vegetables do well. Cotton produces one-third bale per acre under ordinary cultural conditions, but when care is taken one-half bale per acre has been secured year after year. Corn yields 20 bushels per acre, wheat 10 to 15 bushels and millet $1\frac{1}{2}$ tons per acre. Sorghum does exceedingly well. This soil needs nitrogen and crop rotation.

Miller Heavy Clay.—This soil is a clay 8 or 10 inches deep, brown or reddish brown in color, stiff and tenacious when wet, and bakes and cracks on drying. The subsoil is stiffer, lighter, and redder in color.

The Miller heavy clay occurs chiefly in the bottom lands of Tehuacan and Aquilla creeks.

The topography is almost level but the surface as a whole has a gentle slope towards the Brazos River. The surface is generally well drained, but some areas would be greatly improved by artificial drainage.

The type owes its origin to material deposited by the Brazos River, combined with the fine material brought down from the upland prairies by the smaller streams.

Cotton produces one-half bale per acre, corn from 30 to 35 bushels per acre, and oats 40 bushels per acre. Larger yields are procured in the more favorable seasons.

Miller Silt Loam.—The Miller silt loam consists of a fine grained silt loam with a depth of about 15 inches, brown in color and containing a relatively large portion of fine and very fine sand. The subsoil is darker and heavier, but still contains sand. The soil becomes hard and compact and cracks slightly when dry, but breaks up into a mellow seed bed when cultivated.

There are a few small areas of this type, these being west of the river below Waco. The surface is nearly level. The origin of the Miller silt loam is due to deposition of the sediments on the flood plain of the Brazos River, the red color being due to the origin of the material brought down.

A considerable part of this type is used for Johnson grass for pasturage. Cotton, when well cultivated, yields from one-third to one-half bale per acre, corn from 25 to 30 bushels, oats from 30 to 40 bushels, and wheat from 12 to 15 bushels per acre. This type is considered strong for general farming, crops standing the drouth better than those on the more sandy soils.

TABLE 10. COMPOSITION OF SOILS—MCLENNAN COUNTY.

	Crawford Clay.		Crawford Loam.		Houston Black Clay.		Houston Black Clay (probably).		Houston Loam.		Miller Fine Sandy Loam (probably).	
	Surface 3343	Subsoil 3344	Surface 3339	Subsoil 3340	Surface 3335	Subsoil 3336	Surface 4565	Subsoil 3334	Surface 3333	Subsoil 3334	Surface 3205	Subsoil 3206
Percent.												
Phosphoric Acid.....	21	14	.04	.03	.54	.09	.09	.01	.02	.04	.03	.04
Nitrogen.....	15	10	.06	.05	.12	.08	.15	.02	.03	.04	.03	.02
Potash.....	68	64	.26	.27	.79	.78	.41	.21	.21	.19	.31	.32
Total Potash.....	94	94	.74	.94	1.64	1.54	.84	.70	.84	.84	1.17	.40
Lime.....	1.34	1.28	.34	.35	3.30	4.39	8.27	1.7	1.7	1.9	1.16	.15
Magnesia.....	.29	.32	.23	.28	1.12	1.05	4.42	.16	.17	.16	.28	.28
Alumina and Oxide of Iron.....	7.95	10.22	4.51	6.00	11.66	11.85	13.7	3.58	2.73	3.58	4.84	4.37
Insoluble and Soluble Silica.....	80.14	77.20	90.81	88.59	69.78	67.67	56.55	92.72	94.84	92.72	91.68	92.71
Loss on Ignition.....	5.53	5.67	2.17	2.69	8.25	8.17	8.59	1.49	1.49	1.99	1.83	1.42
Moisture.....	3.27	3.78	1.18	1.99	4.60	5.21	7.46	1.54	1.54	1.09	1.09	0.96
Parts Per Million.												
Active Phosphoric Acid.....	414	462	54	14	379	259	22.50	18	21	18	20	24.6
Active Potash.....	587	461	280	246	447	288	191.2	115	155	115	129	51
Acidity.....	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 10—Continued—COMPOSITION OF SOILS—McLENNAN COUNTY.

	Miller Fine Sandy Loam.		Miller Fine Sandy Loam. (probably).	Susquehanna Fine Sandy Loam.		Travis Gravelly Loam.		Yazoo Clay.	
	Surface 3337	Subsoil 3338		Surface 3345	Subsoil 3346	Surface 3331	Subsoil 3332	Surface 3341	Subsoil 3342
Percent.									
Phosphoric Acid.....	.05	.04	.04	.05	.06	.05	.04	.25	.25
Nitrogen.....	.05	.04	.06	.05	.04	.04	.04	.15	.15
Potash.....	.20	.23	.28	.13	.04	.26	.17	.70	.87
Total Potash.....	1.32	1.46	...	.51	.66	1.58	.65	1.10	1.08
Lime.....	.15	.25	.41	.23	.11	.25	.22	2.70	2.70
Magnesia.....	.14	.29	.13	.10	.16	.17	.41	.43	.43
Alumina and Oxide of Iron.....	2.57	3.83	2.19	1.78	3.20	2.82	1.29	7.59	8.76
Insoluble and Soluble Silica.....	94.87	93.20	94.19	95.70	94.24	94.22	95.67	75.14	74.23
Loss on Ignition.....	1.53	1.48	1.52	1.46	1.39	1.58	1.74	6.61	6.23
Moisture.....	.34	.73	.50	.37	.72	.58	.36	3.06	3.89
Parts Per Million.									
Active Phosphoric Acid.....	122	90	161	92	94	65	80	1117	649
Active Potash.....	309	240	....	319	273	222	126	998	849
Acidity.....	0	0	0	0	0	0	0	0	0

DESCRIPTION OF SAMPLES.

3343. Crawford clay: 0"-7"; dark brown; powders very well in wet season; behaves poorly when dry; six miles east of Waco; Dr. Sander-son's farm; does not crack or run together; no fertilizer used; has not been cultivated much; produces well in wet seasons, but does not dry out rapidly; produced 15 bushels corn, 25 bushels oats.

3344. Subsoil to 3343: 7"-14"; black clay.

3339. Crawford loam: 0"-12"; reddish brown sand; four miles west of Waco; Mr. Biggs' farm; no fertilizer used; crumbles; powders well in wet season; small yield in dry season; 2 years in cultivation; cotton and corn chiefly raised; vegetables and fruits do well.

3340. Subsoil to 3339: 12"-24"; reddish brown sand.

3335. Houston black clay: 0"-12"; black clay; very sticky when wet; packs; dries into clods; does not wash; dirt does not wash onto it; Waco, Mrs. Ellis Blake's orchard; 30 to 40 years in cultivation; no fertilizer used; produces one-half bale cotton, 35 bushels corn.

3336. Subsoil to 3335: 12"-24"; black clay.

4565. Houston black clay: 0"-10"; black clay; waxy; in Waco. Dr. Pond's place.

3333. Houston loam: 0"-10"; light brown, sandy; suffers from drouth; four and one-half miles from Waco; J. N. Worthy's farm; good soil; upland; rolling prairie; no fertilizer used; cultivated since 1882; produces 25 to 30 bushels corn, one-fourth to three-fourths bale cotton.

3334. Subsoil to 3333: 10"-22"; dark brown loam.

3205. Miller fine sandy loam: 2"-6"; moderately good; part very fertile; Waco, H. M. Mineir's farm; Brazos bottom land; cultivated 44 years; produces one-eighth to one-third bale cotton.

3206. Subsoil to 3205: 8" depth.

3337. Miller fine sandy loam: 0"-12"; light brown, sandy; behaves well in wet and dry seasons; very good soil; Waco, Mrs. Ellis Blake's orchard field; does not pack, crack or wash; crumbles; cultivated 30 to 40 years; cotton, corn, fruit, and vegetables raised; produces 30 to 35 bushels corn, one-half to one bale cotton.

3338. Subsoil to 3337: 12"-24"; yellow clay.

4564. Miller fine sandy loam: 0"-10"; brown sandy loam; near Waco; Dr. Pond's place; Brazos bottom.

3345. Susquehanna fine sandy loam: 0"-12"; brown; sticky in spots in wet season; suffers from drouth; Waco, J. N. Worthy's place; good soil; no fertilizer used; barnyard manure used on small patches with poor results; does not wash; rather dark and heavy; produces 25 bushels corn, one-half bale cotton.

3346. Subsoil to 3345: 12"-24"; light brown sand.

3331. Travis gravel: 0"-12"; does not pack or crack; perfectly loose; three miles northeast of Waco; F. M. Shick's farm; does best in wet season; nothing grown in dry season; washes only in excessive rains; hilly; water sinks rapidly; cultivated 50 years; C/S fertilizer used, and

doubles yield; 50 bushels to acre barnyard manure, always good increase; fine crops, cantaloupes, melons, etc., chiefly grown.

3332. Subsoil to 3331: 12"-24"; dark brown sand.

3341. Yazoo clay: 0"-12"; black clay; little sticky in wet seasons; works well in dry seasons; does not pack, crack or wash; crumbles; six miles east of Waco; Dr. Sanderson's farm; bottom not subject to overflow; cultivated 50 years; no fertilizer used; produces one-half bale cotton, 40 to 50 bushels oats, and 45 bushels corn.

3342. Subsoil to 3341: 12"-24"; black clay.

TABLE 11. INTERPRETATION OF SOIL ANALYSES OF McLENNAN COUNTY.

Type and County.	Phosphoric acid.	Potash.	Lime.	Corn possibility in bushels per acre for		
				Active phosphoric acid.	Active potash.	Total nitrogen.
Crawford clay.....	good	good	good	74	182	43
Crawford loam.....	good	good	good	30	120	18
Houston black clay.....	good	good	high	50	182	33
Probably Houston black clay.....	good	good	high	18	51	43
Houston loam.....	low	good	fair	18	80	13
Probably Miller fine sandy loam.....	good	good	fair	12	37	13
Miller fine sandy loam.....	fair	good	fair	45	157	18
Probably Miller fine sandy loam.....	good	good	good	40	120	13
Susquehanna fine sandy loam.....	good	good	good	40	157	18
Travis gravelly loam.....	low	good	good	35	29	13
Yazoo clay.....	good	good	high	74 +	207 +	48 +

TABLE 12. CROPS GROWN WITH FERTILIZER IN McLENNAN COUNTY SOIL. (WEIGHT IN GRAMS.)

Lab. No.	Addition.		KPN	KPNCa	KN	KP	PN
3343	Crawford clay.	Oats, 1910.....	19.8	19.8	17.7	9.0	20.7
		Corn, 1911.....	42.0	38.7	40.3	6.1	39.6
		Corn, 1913.....	49.7	.....	.....	29.2	.....
		Sorghum, 1913.....	45.6	.....	.....	10.5	.....
		Sorghum, 1914.....	36.2	.....	.....	11.0	.....
		Corn, 1915.....	44.0	.....	.....	17.2	.....
3344	Crawford clay, subsoil.	Corn, 1914.....	44.4	.....	.....	30.6	.....
		Sorghum, 1914.....	23.5	.....	.....	4.8	.....
		Corn, 1915.....	47.3	.....	.....	8.5	.....
		Corn, 1915.....	25.5	.....	.....	.....	25.4
3339	Crawford loam.	Corn, 1911.....	42.0	4.4	53.2	11.3	40.8
		Sorghum, 1910.....	60.5	56.0	43.2	17.2	60.5
		Mustard, 1910.....	4.4	2.9	3.2	1.4	2.0
3340	Crawford loam.	Sorghum, 1910.....	62.6	57.0	29.0	16.5	57.4
		Mustard, 1910.....	2.4	1.7	1.2	.5	1.0
		Corn, 1911.....	50.3	37.1	10.5	7.4	28.8
		Corn, 1914.....	35.7	.....	.....	21.0	.....
		Sorghum, 1914.....	33.5	.....	.....	2.5	.....
		Corn, 1915.....	36.8	.....	.....	5.5	.....
3335	Houston black clay.	Oats, 1910.....	.....	6.8	5.8	5.5	7.8
		Corn, 1911.....	35.3	40.7	23.3	11.0	43.2
		Corn, 1913.....	29.7	.....	.....	17.7	.....
		Sorghum, 1913.....	40.2	.....	.....	6.1	.....
		Corn, 1914.....	44.5	.....	.....	10.0	.....
		Sorghum, 1914.....	46.0	.....	.....	9.1	.....
3336	Houston black clay.	Corn, 1915.....	30.4	.....	.....	7.2	.....
		Corn, 1914.....	22.3	.....	.....	22.4	.....
		Sorghum, 1914.....	30.0	.....	.....	5.5	.....
		Corn, 1915.....	53.4	.....	.....	4.9	.....

TABLE 13—Continued. CROPS GROWN WITH FERTILIZER IN McLENNAN COUNTY SOIL. (WEIGHT IN GRAMS.)

Lab. No.	Addition.	KPN	KPNCa	KN	KP	PN
3333	Houston loam.	Corn, 1913....	41.0		32.8	
		Sorghum, 1913....	22.5		18.0	
		Sorghum, 1914....	29.5			3.5
		Corn, 1914....	42.5			22.7
		Sorghum, 1914....	32.6		21.9	
		Corn, 1914....	40.7		19.2	
		Corn, 1915....	37.2			5.2
3334	Houston loam.	Corn, 1914....	42.9			20.5
		Sorghum, 1914....	32.0			2.0
		Corn, 1915....	38.8			3.2
3337	Miller fine sandy loam.	Corn, 1910....	24.7	23.7	24.7	11.0
		Corn, 1913....	31.9			21.5
		Sorghum, 1913....	6.6			5.5
		Corn, 1914....	32.3			8.8
		Sorghum, 1914....	4.0			5.8
3338	Miller fine sandy loam.	Corn, 1914....	46.5			17.9
		Sorghum, 1914....	31.8			2.0
		Corn, 1915....	37.5			3.3
4564	Susquehanna fine sandy loam.	Sorghum, 1910....	55.5	5.3	47.6	17.9
		Mustard, 1910....	1.5	2.0	1.8	
		Corn, 1911....	48.2	49.1	35.5	8.2
		Corn, 1914....	48.4			20.2
		Sorghum, 1914....	32.4			5.4
		Corn, 1915....	35.4			3.8
3346	Susquehanna fine sandy loam.	Sorghum, 1910....	40.5	40.7	41.7	6.6
		Mustard, 1910....	1.6			
		Corn, 1911....	48.4			
		Corn, 1914....	42.7			14.2
		Sorghum, 1914....	30.5			2.2
		Corn, 1915....	36.4			4.5
3331	Travis gravel.	Sorghum, 1910....	50.4	49.5	17.5	10.7
		Mustard, 1910....	5.5	4.5	3.2	2.0
		Corn, 1911....	50.8	47.8	15.2	5.4
		Corn, 1913....	39.5			12.4
		Sorghum, 1913....	33.2			1.1
		Corn, 1914....	51.0			5.2
		Corn, 1914....	35.7			10.0
		Sorghum, 1914....	25.5			2.0
		Sorghum, 1914....	41.4			4.3
		Corn, 1915....	36.9			4.0
		Corn, 1915....	29.1			5.7
3332	Travis gravel.	Sorghum, 1910....	50.5	47.5	42.7	14.5
		Mustard, 1910....	2.7	5.1	13.5	4.6
		Corn, 1911....	46.8	54.6	26.9	21.9
		Corn, 1913....	45.2			18.5
		Sorghum, 1913....	33.2			9.1
		Corn, 1914....	40.5			6.4
		Sorghum, 1914....	26.5			5.7
		Corn, 1915....	47.3			49.3
3341	Yazoo clay.	Oats, 1910....	13.2	10.3	9.8	8.4
		Corn, 1911....	38.0	44.2	31.9	15.0
3342	Yazoo clay.	Corn, 1915....	28.41			25.4

SOILS OF TITUS COUNTY.

This area occupies 426 square miles, and is in what is known as the hard timber region of East Texas. The soils, with the exception of a small prairie region in the northeastern corner, are characteristic of the Gulf Coastal Plain. Elevation is from 300 to 500 feet above sea level. The county is well drained. Thirteen different types have been mapped by the Soil Survey of the United States Department of Agriculture. The areas occupied by these types are given in Table 13.

TABLE 13. TITUS COUNTY.

Areas of Different Soils.

Soil.	Acres.	Per cent.
Susquehanna fine sandy loam.....	125,824	46.2
Norfolk fine sandy loam.....	61,952	22.7
Meadow.....	18,432	6.8
Sanders clay.....	15,104	5.5
Susquehanna gravelly loam.....	14,848	5.4
Trinity clay.....	12,032	4.4
Norfolk fine sand.....	11,136	4.1
Wilson loam.....	5,824	2.1
Lufkin fine sandy loam.....	2,368	0.9
Caddo fine sandy loam.....	1,920	0.7
Susquehanna clay.....	1,856	0.7
Sanders silt loam.....	960	0.4
Wilson clay loam.....	384	0.1
Total.....	272,640	.....

The soils of this section are generally low in nitrogen, showing a need for crop rotation, including legumes for the purpose of securing nitrogen from the air. Some of the soils, however, are well supplied with nitrogen at present. As the soils are cultivated, the nitrogen will be exhausted and the need for crop rotation with legumes will be more manifest.

Some of these soils are very well supplied with active phosphoric acid, although a number of them are low in total phosphoric acid. There are, however, some soils very low in active phosphoric acid, especially the Norfolk fine sandy loam. Norfolk fine sand is unusually high in active phosphoric acid for this type of soil. The pot experiments show a need for phosphoric acid and for nitrogen for a number of these soils. Two samples of these soils were found to be acid, these being the Susquehanna gravelly loam and the Susquehanna fine sandy loam. It would require about 600 pounds of quicklime, or stone lime, per acre or 1200 pounds of ground limestone to neutralize the acidity of these soils to a depth of seven inches.

All of the other samples of the soil were not acid, although the lime is low in some of them, comparatively speaking.

DESCRIPTION OF SOIL TYPES OF TITUS COUNTY.

Norfolk Fine Sand.—This is the sandiest soil found in the area. The surface soil for 6 inches consists of a gray fine sand. Below this the soil is composed of the same grades of sand, growing lighter in color as the depth increases. At 3 or 4 feet is found a yellow sandy clay. The soil is loose and incoherent. It occurs in a few areas of several square miles and in a number of smaller areas in nearly all parts of the county, extensive stretches occurring on the central ridge.

The soil is naturally well drained, is one of the warmest soils of the county, and well suited for the production of early truck crops. The agricultural value of the soil depends largely upon its depth; when the sand is too deep it is not productive. Such areas suffer in drouths, lack organic matter, and are very difficult to improve. This land,

locally known as "blackjack" land, is not cultivated. The larger part of the Norfolk fine sand, however, is a valuable farming land. It is remarkably productive for a sandy land. Most areas in this county seem to be as productive after years of cultivation as when first cleared.

The principal crops grown have been corn and cotton, but there is a tendency towards diversification. Legumes, especially peanuts, have been grown with success. The yield of cotton ranges from one-fourth to one-half bale per acre; that of corn from 15 to 25 bushels. Where the soil is not too deep and leachy, peach orchards are uniformly successful. This soil needs nitrogen and legume rotation.

Norfolk Fine Sandy Loam.—The soil of this type consists of a gray or yellowish gray fine sandy loam or loamy sand. The depth ranges from 10 to 20 inches, averaging about 12 inches. The subsoil is a yellow or brownish yellow sandy clay, which passes at 3 feet or more into a mottled gray or yellow clay. The surface soil for 2 inches is darkened with organic matter. This type is found in all of the upland part of the county outside of the prairies. The larger uniform areas occur in the southern part of the county. It is not confined to any one kind of topography, nor to any particular elevation, but is more likely to be found on flats where the drainage is slightly retarded and weathering has taken place under conditions different from those that produced the mottled and red subsoil.

The greater part of the type has good natural drainage. Any part can be drained by the simplest methods and at small expense for ditching. The Norfolk fine sandy loam is regarded by some as the most desirable soil in the county for the system of farming now practiced. It stands drouth as well as any other soil in the county. It is especially adapted to truck and peanuts. Corn and cotton are the principal crops, cotton yielding from one-fourth to one-half bale per acre and corn from 15 to 25 bushels. Cowpeas, peaches and potatoes do well on this soil. This soil needs phosphates, and nitrogen, with a legume rotation.

Susquehanna Fine Sandy Loam.—This is the most extensive and important soil type in Titus county. The soil is a gray, fine, very sandy loam, and in some places almost a sand. The depth ranges from 6 to 18 inches, averaging 12 inches. The subsoil is usually a red and yellow clay mottled with drab, passing, before a depth of 3 feet is reached, into a less weathered clay of solid drab or brown color. The surface soil is similar to that of the Norfolk fine sandy loam. It is loose, porous and easily cultivated. The subsoil is a fine clay, stiff and waxy but not so impervious as to be injurious to crops where the position of the land is favorable to drainage.

South of White Oak creek and between it and Sulphur River, are numerous low, poorly drained areas, where the soil is more silty and the drab color predominates in the subsoil. The Susquehanna fine sandy loam is found in all parts of the upland, except in the prairies and in the northwestern section of the county. The largest stretch of the type lies between Sulphur River and White Oak creek. The topography is generally gently rolling to hilly. A large part of the type is

still uncleared, the native forest growth consisting of oak, hickory, and other hardwoods.

The type is productive and holds its fertility well. Cotton yields from one-fourth to one-half bale per acre and corn from 15 to 20 bushels, these being the principal crops. Peanuts, potatoes, sweet potatoes, cowpeas, and all truck crops do well. Fertilizers are used to a small extent.

The soil is easily eroded,—a fault that should be guarded against by contour plowing, terracing, and the growing of cover crops. This soil is fairly well supplied with phosphoric acid, but needs nitrogen and legume rotation, and one sample needs lime.

Susquehanna Gravelly Loam.—The soil is a gray or reddish gray, very sandy loam to an average depth of about 10 inches. The subsoil is a deep red clay, with more or less sand passing at lower depths into a heavy mottled red and yellow clay. A considerable quantity of gravel is scattered over the surface and through both soil and subsoil, consisting of fragments of iron crusts and small iron concretions.

The type is found in small areas in nearly all parts of the upland, but there are several large areas southeast of Mount Pleasant. The large areas cover high ridges and sharply rolling country. The soil is well drained and considered one of the earliest and most desirable soils in the county. Good crops are produced without fertilizers and the soil is stronger than any other in the county. Cotton yields from one-fourth to two-thirds bale per acre and corn about 20 bushels. The soil is not so well adapted to peaches as the more sandy types; peanuts do well and this should be a favorite crop. This soil needs a legume rotation.

Lufkin Fine Sandy Loam.—The soil is a silty, fine sandy loam, 12 inches deep and dark gray to brown in color. The subsoil is a stiff impervious compact, brown clay. It is usually poorly drained and when so is hard to handle as it runs together when wet and becomes compact and cohesive.

This soil is limited to the prairie regions and to some small sparsely wooded areas on the edge of the prairie. The largest area lies south of White Oak creek, and west of Ripley creek. The surface is level, and artificial drainage is needed badly. Very little of this type is cultivated. It is adapted to cotton, corn, and oats. The greater part is used for pasture. Where wooded, the growth is principally post oak and scrub oak. This soil needs phosphoric acid and a legume rotation.

Wilson Loam.—This soil to the depth of 8 inches is a heavy brown loam, containing very fine sand and a large percentage of silt. The subsoil is a yellow to brown, sticky, impervious clay to a depth of 3 feet or more. When dry the soil pulverizes readily, and may be easily kept in good condition, but in wet seasons it turns up in clods and is liable to puddle and bake. Crops upon this soil are quickly damaged by too much rain and do not stand drouth well. But where drainage is good this is one of the most valuable types of the county. This is a prairie soil and is largely pasture. Where well drained, it produces

one-half to two-thirds of a bale of cotton, and with good cultivation produces a bale to the acre in favorable years. Corn yields 20 to 30 bushels; potatoes and garden truck do well, and ribbon cane is grown on the lower portion.

According to the chemical analysis of the sample, this soil is low in phosphoric acid and will need nitrogen and crop rotation after it has been in cultivation for a short time. It is possible, however, that the samples do not fairly represent the area.

Sanders Clay.—The Sanders clay consists of a heavy, brown silty clay to a depth of 9 inches, with a lighter colored clay loam subsoil. In some places the subsoil is streaked or mottled by brown iron stain. The soil varies considerably in character, as it is an alluvial soil which receives the wash from adjacent hills. It is found as a continued body along White Oak creek. Very little of this type is cultivated and the crops are uncertain on account of the danger of overflows.

The chemical analysis shows that the samples are well supplied with phosphoric acid and potash, but one of them is somewhat low in nitrogen. A crop rotation would, therefore, be of benefit.

TABLE 14—Continued. COMPOSITION OF SOILS—TITUS COUNTY.

	Norfolk Fine Sandy Loam. (probably).		Sanders Clay.		Sanders Clay.		Susquehanna Fine Sandy Loam.	
	Surface 7179	Subsoil 7180	Surface 2333	Subsoil 2334	Surface 2340	Subsoil 2341	Surface 2337	Subsoil 2338
Percent.								
Phosphoric Acid.....	.03	.02	.02	.08	.09	.05	.09	.03
Nitrogen.....	.03	.04	.05	.05	.14	.08	.11	.04
Potash.....	.10	.17	.11	.11	.05	.42	.41	.40
Total Potash.....			1.16	1.52	1.44	1.24	1.44	1.22
Lime.....	.15	.08	.13	.17	.31	.14	.19	.12
Magnesia.....	.07	.09	.13	.44	.63	.45	.49	.34
Alumina and Oxide of Iron.....	1.67	5.60	2.78	9.65	8.78	9.18	9.31	16.26
Insoluble and Soluble Silica.....	96.10	91.29	94.94	83.91	79.97	82.43	82.34	73.79
Loss on Ignition.....	1.12	1.82	1.52	3.30	6.15	4.15	5.80	5.75
Moisture.....	.30	.76	1.32	2.47	3.45	3.29	2.77	3.19
Parts Per Million.								
Active Phosphoric Acid.....	45	18	38	65	36	17	71	96
Active Potash.....	147	124	175	150	278	147	206	159
Acidity.....	0	400	0	0	0	0	0	0

TABLE 14—Continued. COMPOSITION OF SOILS—TITUS COUNTY.

	Susquehanna Gravelly Loam.		Susquehanna Gravelly Loam.		Susquehanna Fine Sandy Loam.		Wilson Loam.	
	Surface 2329	Subsoil 2330	Surface 2346	Subsoil 2347	Surface 2350	Subsoil 2351	Surface 2327	Subsoil 2328
Percent.								
Phosphoric Acid.....	.03	.04	.05	.04	.02	.02	.04	.05
Nitrogen.....	.05	.03	.08	.03	.01	.01	.09	.07
Potash.....	.16	.19	.14	.17	.13	.13	.29	.49
Total Potash.....	.80	.90	.26	.....	.42	.78	.98	1.23
Lime.....	.11	.14	.17	.10	.11	.11	.15	.28
Magnesia.....	.11	.31	.17	.23	.16	.23	.25	.25
Alumina and Oxide of Iron.....	3.17	9.30	3.02	9.86	2.66	18.86	6.59	15.01
Insoluble and Soluble Silica.....	93.38	85.19	83.21	85.23	95.35	74.04	86.59	72.85
Loss on Ignition.....	1.80	3.00	6.5	3.52	1.40	4.35	3.75	5.60
Moisture.....	.40	1.47	.36	1.15	.40	5.26	1.64	4.00
Parts Per Million.								
Active Phosphoric Acid.....	21	4	185	6	9	4	11	.....
Active Potash.....	151	96	200	148	86	92	137	.....
Acidity.....	0	500	200	200	200	200	0	0

DESCRIPTION OF SAMPLES.

2342. Lufkin fine sandy loam: 0"-8"; light brown; bakes in dry years; hard to cultivate in wet years; C. M. Block's farm, Winsfield; level; fairly productive, but uncultivated; produces one-third to one-half bales cotton or 15 to 20 bushels corn.

2343. Subsoil to 2342: 9"-20"; whitish brown.

2335. Norfolk fine sand: 0"-12"; dark brown; easily handled in wet weather; crops suffer from drouth; 1000 feet northwest of water tower, Mt. Pleasant; no fertilizer used; produces one-third to one-half bales cotton or 20 bushels corn.

2336. Subsoil to 2335: 13"-22"; dark brown.

2352. Norfolk fine sand: 0"-6"; light brown; Mary May's farm, one and one-half miles south of Mt. Pleasant; rolling; soil good; produces one-fourth to one-half bales cotton or 15 to 25 bushels corn.

2353. Subsoil to 2352: 7"-22"; light brown.

2331. Norfolk fine sandy loam: 0"-12"; light brown; four miles northwest of Mt. Pleasant, Chas. A. Hinson's farm; holds water in wet years; crops do well in dry years; produces one-half bale cotton or 15 bushels corn.

2332. Subsoil to 2331: 13"-22"; light brown.

2348. Norfolk fine sandy loam: 0"-10"; light brown; easily handled in wet and dry seasons; five miles southeast of Mt. Pleasant, W. T. Edwards' farm; land run down due to constant cropping with cotton and careless farming; produces one-fourth to one-third bale cotton or 15 to 20 bushels corn.

2349. Subsoil to 2348: 11"-21"; reddish brown.

7179. Norfolk fine sandy loam: 0"-8½"; light brown sand; four miles south of Cookville; W. E. Rus' farm; poor; produces 400 pounds cotton or 10 bushels corn.

7180. Subsoil to 7179: 8½"-17½"; yellowish red, sandy clay.

2333. Sanders clay: 0"-12"; whitish brown; one-half mile north of Evans' bridge; overflows every year; produces three-fourths bale cotton or 30 bushels corn; not used much.

2334. Subsoil to 2333: 13"-24"; whitish brown.

2340. Sanders clay: 0"-8"; light brown; hard to cultivate when wet; works well when dry; T. B. Caldwell's farm, Mt. Pleasant; subject to overflow; unused; produces three-fourths bale cotton or 30 bushels corn.

2341. Subsoil to 2340: 9"-21"; light brown.

2337. Susquehanna fine sandy loam: 0"-16"; light brown; withstands drouth well; easily cultivated; rolling; produces one-third to one-half bale cotton; 20 bushels corn.

2338. Subsoil to 2337: 17"-24"; red.

2350. Susquehanna fine sandy loam: 0"-12"; reddish brown; washes; easily tilled in wet years; withstands drouth; one mile east of Mt. Pleasant, Carr heirs' farm; no fertilizer; produces one-fourth to one-half bale cotton or 20 to 30 bushels corn.

2351. Subsoil to 2350: 13"-24"; red; 2 per cent. gravel.

2329. Susquehanna gravelly loam: 0"-8"; reddish brown; easily tilled in wet and dry seasons; withstands drouth; two and one-half miles east of Mt. Pleasant, F. W. Fitzpatrick's farm; produces one-half to two-thirds bale cotton.

2330. Subsoil to 2329: 9"-20"; light red.

2346. Susquehanna gravelly loam: 0"-10"; reddish brown; withstands drouth and wet seasons; four and one-half miles east of Mt. Pleasant, J. C. Kirby's farm; very productive; produces one-half bale cotton or 20 bushels corn.

2347. Subsoil to 2346: 11"-22"; red.

2327. Wilson loam: 0"-10"; light brown, puddles when wet and is hard to cultivate; bakes when dry and crops suffer; one mile east of Daphne, J. M. Clark's farm; produces one-half to three-fourths bale cotton, 30 bushels corn; level to gently rolling prairie.

2328. Subsoil to 2327: 11"-20"; light brown.

TABLE 15. INTERPRETATION OF SOIL ANALYSIS OF TITUS COUNTY.

Type and County.	Phosphoric acid.	Potash.	Lime.	Corn possibilities in bushels per acre for		
				Active phosphoric acid.	Active potash.	Total nitrogen.
Lufkin fine sandy loam.....	fair	good	fair	6	51	23
Norfolk fine sand.....	low	good	good	35	51	18
Norfolk fine sand.....	low	good	good	35	51	18
Norfolk fine sandy loam.....	low	low	fair	12	51	18
Norfolk fine sandy loam.....	low	low	fair	6	37	13
Probably Norfolk fine sandy loam.....	low	low	fair	30	51	13
Sanders clay.....	low	low	good	24	80	18
Sanders clay.....	good	low	good	24	120	38
Susquehanna fine sandy loam.....	fair	good	fair	35	120	33
Susquehanna gravelly loam.....	low	good	fair	18	80	18
Susquehanna gravelly loam.....	fair	fair	fair	45	80	23
Susquehanna fine sandy loam.....	low	fair	fair	40	37	8
Wilson loam.....	fair	good	fair	12	51	28

TABLE 16. CROPS GROWN WITH FERTILIZERS IN TITUS COUNTY SOIL. (WEIGHT IN GRAMS.)

Lab. No.	Addition.		KPN	KPNCa	KN	KP	PN
2312	Lufkin fine sandy loam.	Corn, 1910	50.0	53.5	6.3	15.0	49.0
		Sorghum, 1910	40.9	48.4	9.9	7.0	32.5
		Mustard, 1910 . . . . .	.2	1.8	.....	.....	0.1
		Corn, 1911	51.2	47.6	.....	.....	23.7
2313	Lufkin fine sandy loam.	Corn, 1910	4.05	41.0	4.5	19.5	37.1
		Sorghum, 1910	42.4	.....	.....	.....	31.7
		Corn, 1912	35.1	.....	4.2	.....	.....
		Sorghum, 1912	20.1	.....	6.2	.....	.....
		Corn, 1913	31.2	.....	5.2	.....	.....
		Sorghum, 1913	16.8	.....	1.1	.....	.....
		Sorghum, 1913	31.2	.....	1.5	.....	.....
		Corn, 1914	39.0	.....	.....	11.0	.....
		Sorghum, 1914	20.7	.....	5	.....	.....
2352	Norfolk fine sand.	Mustard, 1909	6.8	6.5	6.2	3.5	6.0
		Corn, 1910	36.5	41.0	22.5	8.0	38.2
		Corn, 1910	25.2	20.7	.....	.....	15.2
		Mustard, 1911	0.8	0.6	0.5	0.8	0.5
		Corn, 1911	36.6	40.8	25.3	11.8	9.5

TABLE 16—Continued. CROPS GROWN WITH FERTILIZERS IN TITUS COUNTY (WEIGHT IN GRAMS).

Lab. No.	Addition.	KPN	KPNCa	KN	KP	PN	
2353	Norfolk fine sand.	Mustard, 1909.	1.6	0.6	2.2	1.9	3.0
		Corn, 1910. . . .	26.6	30.1	14.0	3.7	19.1
		Corn, 1910. . . .	29.4	31.7	15.2	3.2	17.2
		Corn, 1913. . . .	51.7		15.4		
		Sorghum, 1913.	33.7		28.7		
		Corn, 1914. . . .	49.2		36.3		
		Sorghum, 1914.	15.7		11.2		
2348	Norfolk fine sandy loam.	Mustard, 1909.	2.3	2.5	1.2	1.6	2.0
		Corn, 1910. . . .	33.0	48.2	6.0	12.0	37.0
		Corn, 1910. . . .	5.1	6.3			4.0
		Mustard, 1910.	0.3	3.0			0.8
		Corn, 1911. . . .	42.2	47.8			18.8
7179	Norfolk fine sandy loam.	Corn, 1914. . . .	48.2			17.2	
		Sorghum, 1914.	44.9			3.2	
		Corn, 1915. . . .	28.2			4.0	
7180	Norfolk fine sandy loam.	Corn, 1914. . . .	49.6			18.6	
		Sorghum, 1914.	31.4			1.5	
		Corn, 1915. . . .	26.7			2.8	
2340	Sanders clay.	Mustard, 1909.	1.5	5.1	40	3.0	3.5
		Corn, 1910. . . .	41.5	38.5	28.7	23.5	50.3
		Sorghum, 1910.	44.7	44.2	45.2	10.7	45.7
		Mustard, 1910.	6.2	5.7	0.9	1.8	2.0
2341	Sanders clay.	Mustard, 1909.	4.0	5.0	2.3	2.8	1.9
		Corn, 1910. . . .	37.0	40.0	3.0	18.0	30.0
		Sorghum, 1910.	28.9	36.4	15.3	2.1	27.7
		Mustard, 1910.	0.1				0.1
		Corn, 1911. . . .	40.4				29.3
		Corn, 1912. . . .	38.5				43.5
		Sorghum, 1912.	16.9				17.1
2350	Susquehanna fine sandy loam.	Mustard, 1909.	2.9	2.0	0.1	3.0	3.0
		Corn, 1910. . . .	48.0	27.2	6.0	7.0	23.5
		Sorghum, 1910.	46.4				27.0
		Corn, 1913. . . .	40.2		8.4		
		Sorghum, 1913.	31.4		10.0		
		Corn, 1914. . . .	34.5		8.7		
		Sorghum, 1914.	30.3			2.5	
		Corn, 1914. . . .	47.0			20.4	
		Sorghum, 1914.	19.7			2.2	
		Corn, 1915. . . .	36.2			3.3	
2351	Susquehanna fine sandy loam.	Mustard, 1909.	0.2	2.0	0.2		0.1
		Corn, 1910. . . .	15.0	22.2	2.5	8.5	16.2
		Corn, 1910. . . .					1.3
		Mustard or Oats, 1910. .	3.9	2.9	0.5	2.2	0.3
2346	Susquehanna gravelly loam.	Corn, 1910. . . .	45.6	38.6	21.0	25.0	46.0
		June Corn, 1910	7.9				5.5
2347	Susquehanna gravelly loam.	Mustard, 1909.	3.0	5.0	2.6	2.3	3.2
		Corn, 1910. . . .	25.2	22.0	2.0	10.0	27.1
		Sorghum, 1910.	24.5				22.2
		Corn, 1913. . . .	22.7			15.2	
		Sorghum, 1913.	23.2			2.6	
		Corn, 1914. . . .	36.2			3.9	
		Sorghum, 1914.	34.5			1.5	
		Corn, 1915. . . .	26.9			2.8	

SOILS OF TYLER COUNTY.

The area surveyed covers 100 square miles in the central part of Tyler county. The area surveyed is characterized by hilly, rolling topography, with some alluvial soil in the stream bottoms. Four types of soil have been recognized in this area. The areas are given in Table 17. The soils analyzed are all low in nitrogen, low in potash, and with one exception, low in active phosphoric acid. Three of the

four samples of soil are also acid,—a condition that shows the need of lime.

This area needs a rotation of crops, including a legume, to be supplemented by an application of acid phosphate and, very likely, potash fertilizers. The soils should also receive an application of a sufficient quantity of lime to correct the acidity.

TABLE 17. WOODVILLE AREA.

Areas of Different Soils.

Soil.	Acres.	Per cent.
Norfolk sandy loam.....	52,864	82.6
Meadow.....	5,568	8.7
Lufkin clay.....	4,416	6.9
Orangeburg sandy loam.....	1,152	1.8
Total.....	64,000	.....

DESCRIPTION OF SOILS OF TYLER COUNTY.

Norfolk Sandy Loam.—The surface soil of this type is a loose, gray to grayish yellow sand of a uniform and medium texture, except near the boundary line dividing it from the Lufkin clay, where it is rather compact. It varies in depth from 12 inches to 36 inches, or more. In some localities the soil contains a small percentage of rounded iron concretions which often increases to between 10 to 25 per cent near the boundary line between it and the Orangeburg sandy loam. The subsoil is a brownish yellow to greenish red clay, usually containing a high percentage of sand, and often mottled with gray.

The Norfolk sandy loam is the most extensive type of the area and is very generally distributed. It is generally rolling and the drainage is generally excellent, although the water sometimes stands on the peat-topped hills for some time after heavy rains.

Not over 5 per cent. of the total area of this type is in cultivation (1903); the remainder being covered by forest. Corn and cotton are the principal crops, the latter producing in favorable seasons upward of one-half bale per acre. The forest growth consists of magnolia, willows, and water oaks in the moister places, short leaf and loblolly pine, white oak, beech, ironwood, hickory, sweet gum, and holly on the lower hills, and long leaf pine on the higher elevations. This should be a valuable truck soil. This soil is low in all forms of plant food and is acid and needs lime.

Lufkin Clay.—This type varies considerably, both in depth and texture. The typical profile consists of 3 to 8 inches of fine sand, or sandy loam, underlain by a yellowish or reddish yellow clay, which usually contains a considerable percentage of sand. It is generally mottled—red, yellow, and white.

The largest area of this type occurs one mile east and southeast of Woodville. In general, the topography is rolling, although a few small areas are level. The drainage is satisfactory except on the level areas.

Comparatively little of this type is cultivated; it produces about three-fourths bale cotton or 25 bushels of corn per acre.

This is considered to be the best soil for general farming in the area. While not so strong as the small areas of alluvial soil near the streams, it is better drained, retains moisture well, always cultivatable, and much more productive than the Norfolk sandy loam. This soil is low in plant food and is acid and needs lime.

Norfolk Sand.—Norfolk sand, although not mapped in the area named, probably occurs in this county, and one of the samples belongs to this type. Norfolk sand is a light, sandy soil, and is characterized by a sandy subsoil to a depth of about 3 feet. It is a good soil for early vegetables, but does not produce very large crops of corn or cotton. The sample examined is low in phosphoric acid, potash, and nitrogen, and is acid and needs an application of lime.

TABLE 18. COMPOSITION OF SOILS—TYLER COUNTY.

	Lufkin Clay.	Norfolk Sand (probably).		Norfolk Sandy Loam.	Norfolk Sandy Loam. (probably).	
	Surface 3976	Surface 4648	Subsoil 4649	Surface 3977	Surface 9139	Subsoil 9140
Per Cent.						
Phosphoric Acid.....	.03	.02	.03	.02	.....	.04
Nitrogen.....	.03	.02	.01	.04	.03	.03
Potash.....	.23	.10	.04	.03	.08	.04
Total Potash.....	.....	.....	.52	.16	.....	.....
Lime.....	.19	.04	.09	.08	.22	.59
Magnesia.....	.24	.05	.05	.05	.07	.07
Alumina and Oxide of Iron.....	8.71	1.43	1.11	1.39	.80	2.25
Insoluble and Soluble Silica.....	84.94	97.18	97.80	96.42	97.16	93.95
Loss on Ignition.....	3.09	1.26	.67	1.69	.94	1.19
Moisture.....	2.26	.23	.12	.16	.21	.86
Parts Per Million.						
Active Phosphoric Acid.....	12	14	10	17	124	8
Active Potash.....	100	70	74	92	62	28
Acidity.....	1000	200	200	200	460	230

DESCRIPTION OF SAMPLES.

3976. Lufkin clay: 0"-12"; yellowish red clay; one mile southwest of Woodville, H. A. Cruse's farm; level; produces 25 bushels corn.

4648. Norfolk sand: 0"-6"; white, sandy; very poor; upland; one mile west of Woodville; commercial fertilizer does not increase yield appreciably; soil does not pack, crack, and washes a little; surface soil very shallow; produces one-eighth bale cotton or 10 bushels potatoes.

4649. Subsoil to 4648: 6"-16"; white, sandy.

3977. Norfolk sandy loam: 0"-9"; yellowish red; three-fourths mile northwest of Woodville, H. A. Cruse's farm; formerly fertilized; produces 25 to 30 bushels corn; moderate soil.

9139. Norfolk sandy loam: 0"-6"; light gray; one-half mile northwest of Woodville, J. B. Riley's farm; 300 pounds to acre fertilizer; produces 20 bushels corn or 100 bushels potatoes; is rolling.

9140. Subsoil to 9139: 6"-14"; sandy clay.

TABLE 19. INTERPRETATION OF SOIL ANALYSIS OF TYLER COUNTY.

Type and County.	Phos- phoric acid.	Potash.	Lime.	Corn possibility in bushels per acre for		
				Active phos- phoric acid.	Active potash.	Total nitro- gen.
Lufkin clay.....	low	fair	low	12	37	13
Probably Norfolk sand.....	low	fair	low	12	37	8
Norfolk sandy loam.....	low	low	low	12	37	13
Probably Norfolk sandy loam.....	.....	low	good	45	37	13

TABLE 20. CROPS GROWN WITH FERTILIZER IN TYLER COUNTY SOIL.
(WEIGHT IN GRAMS).

Lab. No.	Addition.		KPN	KPNCa	KN	KP	PN
3976	Lufkin clay.	Oats, 1910.....	13.0	14.5	2.8	8.1	11.1
		Corn, 1911.....	31.8	30.5	3.4	4.2	24.3
3977	Norfolk sandy loam.	Oats, 1910.....	14.6	13.0	6.0	7.9	13.5
		Corn, 1911.....	27.7	25.2	6.7	4.6	22.6

ACKNOWLEDGMENT.

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SUMMARY AND CONCLUSIONS.

This bulletin contains a description of soil types in Grayson, Lee, McLennan, Titus, and Tyler counties, together with chemical analyses of representative samples and a discussion of their needs for plant food.

TEXAS AGRICULTURAL EXPERIMENT STATION

BULLETIN NO. 193

AUGUST, 1916

DIVISION OF CHEMISTRY

Commercial Fertilizers in 1915-16



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BY

G. S. FRAPS, Ph. D.,
CHEMIST IN CHARGE; STATE CHEMIST



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*As of September 1, 1916.

**In cooperation with the United States Department of Agriculture.

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Commercial Feeding Stuffs, 1915-16

TEXAS FEED LAW,

BY

B. YOUNGBLOOD, DIRECTOR.

The Twenty-ninth Legislature of the State of Texas passed an act—

(1) Regulating the sale of concentrated commercial feeding stuffs and the material from which they are manufactured.

(2) Defining them.

(3) Prohibiting their adulteration.

(4) Providing for their correct weighing and marking.

(5) Providing for the collection of samples.

(6) Providing for the expenses of enforcing the law.

(7) Fixing penalties for violations, and

(8) Empowering the Director of the Experiment Station (a) to adopt standards, names and definitions; (b) to refuse registration of any feeding stuff under a name which would be misleading as to the materials of which it is made up, or which does not conform to the standards, names and definitions aforesaid, and (c) after ten days' notice to cancel such registration as may, from time to time, be found to be in violation of the law or the names, standards and definitions adopted by the Director of the Experiment Station in accordance with this law.

The law is printed in the back of this bulletin.

The Purpose of the Feed Control Service.—The purpose of the Feed Control Service is to afford protection alike to the sellers and the buyers of concentrated commercial feeding stuffs in the State of Texas. This end is attained by the Feed Control Service by

(I) Requiring that no feeding stuff shall be sold under a name that is in the least misleading. This means that no person or corporation shall sell a *mixture* for a *pure product*. For instance, it is a violation of the law to sell a mixture of cottonseed meal and hulls under the name of "Cottonseed Meal," when obviously the correct definition is "Cottonseed Meal and Hulls."

(II) Requiring that the correct analysis of each and every feeding stuff sold within the State *shall be printed—not stamped—on the inspection tag*. By a comparison of the constituents, analysis and the price of a given feeding stuff with those of another, the buyer is enabled to determine for himself which feeding stuff is the cheapest and the best suited for his particular purpose. If he should have any difficulty in this regard he should write the Feed Control Service for additional information.

The seller of feeding stuffs is protected by the development of uniform standards which eliminate unfair competition. He is expected to

comply with the law, not merely for the sake of compliance, but because in the long run it is the wiser course. The seller who habitually complies with the law has the confidence of the feeders and the public generally and avoids the unnecessary expense and the unsavory reputation incident to prosecution for violations.

What the Term Includes.—The term "concentrated commercial feeding stuff," as herein used, shall include wheat bran, wheat shorts, linseed meal, cottonseed meal, cottonseed cake, peanut cake, cocoanut meal, gluten meal, gluten feeds, sugar feeds, dried brewers' grains, malt sprouts, hominy feeds, cerealine feeds, rice bran, rice polish, oat feeds, corn chops, ground beef, kafir feed, alfalfa meal, corn feed meal, rolled oats, cold pressed cottonseed, ground cold pressed cottonseed, rice hulls, corn bran, blood meal, digester tankage, cracklings, meat scrap, meat meal, meat and bone scrap, meat and bone meal, buckwheat shorts, corn germ meal, flax plant by-products, oat groats, oat middlings, poultry feed, oat shorts, mixed feeds, and all other materials of a similar nature.

What is Not Included.—The term "concentrated commercial feeding stuff," as herein used, shall not include hay, straw, the whole seeds of grains of wheat, barley, rye, oats, Indian corn, rice, buckwheat or broom corn, or any other whole or unground grains of seeds. However, should there be added to hay, straw, whole or unground grains or seeds, any cracked grains or seeds which come under concentrated commercial feeding stuffs, the whole would then be treated as a concentrated commercial feeding stuff, and subject to the requirements of the law.

Adulterants.—The following ingredients are classed as adulterants: screenings, rice hulls, peanut hulls, chaff, oat hulls, oat meal by-products, ground corn cobs, ground alfalfa, ground hay and all other materials of a similar nature.

How to Comply with the Law.—Briefly summarized, the law requires manufacturers and importers of concentrated commercial feeding stuffs, or the party or parties who cause them to be sold or offered or exposed for sale, to comply with the following requirements:

All Concentrated Commercial Feeding Stuffs Must Be Registered.—Any person, manufacturer, importer or agent desiring to sell or offer for sale within this State any concentrated commercial feeding stuff shall submit a sample of the feeding stuff to be registered, of at least one pound for analysis. This sample should be shipped prepaid either by parcel post or express, in a sealed glass jar or bottle. The sample must be a fair average of the feeding stuff to be registered. Upon receipt of this sample, registration forms will be furnished. If, upon analysis, the feeding stuff is found to conform to the required names, definitions and standards and otherwise complies with the intent of the law, the feeding stuff will be registered.

Concentrated Commercial Feeding Stuffs Must Be Tagged.—After a feeding stuff is registered the person, manufacturer, agent or importer is notified that he may offer it for sale, provided he attaches the official tax tag as required by law. Tags are purchased from the Feed Control

Service and are sold at such a price as will make the inspection tax 10 cents per ton on all concentrated commercial feeding stuffs sold or offered for sale within the State of Texas. One tag should be attached to each bag, barrel or other package of feeding stuff sold or offered for sale.

The following information is required to be printed on the reverse side of tax tags, by the person, agent, dealer, manufacturer or importer. Under no circumstances will the Feed Control Service print this information on the tags:

- (1) Number of net pounds of feeding stuff the package contains.
- (2) Name of feeding stuff, exactly as shown in registration.
- (3) Names of material of which such feed is composed, where the contents are of a mixed nature.
- (4) Percentage of all ingredients where corn cobs, rice hulls, or any other adulterant, is present.
- (5) Name and address of manufacturer or importer and place of manufacture.
- (6) Guaranteed analysis, stating the minimum percentage of crude protein, crude fat, nitrogen-free extract, and the maximum percentage of crude fiber, in the feeding stuff, exactly as shown in registration.

Attention is called to the fact that all information on the tax tag must be *printed*. *The use of rubber stamp for this purpose is not permitted.*

We suggest that the foregoing information be PRINTED on the reverse side of the tag in the following form:

100 Pounds (Net) Corn Chops
Manufactured by
JOHN DOE MILLING COMPANY
Doeville, Texas.

GUARANTEED ANALYSIS.

Protein not less than.....	9.00 per cent.
Fat not less than.....	3.50 per cent.
Nitrogen-free Extract not less than.....	70.00 per cent.
Crude Fiber not MORE than.....	3.00 per cent.

Weights.—The law fixes the standard weights for feeding stuffs as follows:

Mill products have the following standard weights, viz.: Flour, one hundred and ninety-six (196) pounds per barrel or forty-eight (48) pounds per sack. Corn meal, bolted or unbolted, thirty-five (35) pounds per sack; rice bran, one hundred and forty-three (143) pounds per sack; rice polish, two hundred (200) pounds per sack; and other feeding stuffs made from cereals of any kind, whether pure, mixed or adulterated, one hundred (100) pounds per sack. Fractional barrels, sacks or packages, shall weigh in the same proportion, as, one-sixteenth, one-eighth, one-fourth, one-half, and three-fourths. ~~Do~~ Sacks and barrels of odd weights, as for instance, 93½ or 90 pounds, are not contemplated

in the feed law and tax tags for such odd weights as these are not carried in stock by the Feed Control Service.

Bulk Sales.—It shall be the duty of the manufacturer or importer or agent in the sale and shipment of concentrated commercial feeding stuffs in bulk, to furnish the purchaser with tags to cover, at the regular tonnage rate of twenty tags per ton. For instance, if Cotton Oil Co., manufacturers, or Jones & Co., importers, sell to Roberts & Son, ranchmen, Odessa, Texas, a carload of loose cake, it will be the duty of Cotton Oil Co. or Jones & Co. to transmit to Roberts & Son tags sufficient to cover the shipment. In the event that Roberts & Son fail to receive these tags simultaneously with the shipment it will be their duty to immediately notify the Feed Control Service. A complete record of such sales, with number of tags furnished, should at all times be kept by manufacturers, agents or importers, for the information of the Feed Control Service.

Penalties.—The penalty for using any bag, box or barrel, or any other receptacle into which to put a product other than one bearing the name of such mill manufacturing the product, is a fine of any sum from one hundred dollars (\$100.00) to one thousand dollars (\$1000.00) or confinement in the county jail for a term of thirty (30) days or both such fine and imprisonment.

The penalty for selling or offering for sale concentrated commercial feeding stuffs without tax tags, or with a label stating that the feeding stuff contains substantially a larger percentage of protein, crude fat or nitrogen-free extract, or a smaller quantity of crude fiber than it does contain, is a fine of not less than one hundred dollars (\$100.00) nor more than five hundred dollars (\$500.00) for the first conviction, and not less than five hundred dollars (\$500.00) nor more than one thousand dollars (\$1000.00) for each subsequent conviction.

A fine of not more than five hundred dollars (\$500.00) is the penalty for counterfeiting or using a tax tag the second time. This penalty may be increased for subsequent offenses. The law provides that one-half of the fine be paid to the informer.

The penalty for selling adulterated feeding stuffs is a fine of not less than twenty-five dollars (\$25.00) or imprisonment in the county jail for not less than thirty (30) days and not more than sixty (60) days, or both such fine and imprisonment.

Copy of the feeding stuff law and blank forms for registering feeding stuffs for sale, will be furnished upon request.

Feeders Must Inform Themselves.—Feeds must be wholesome. They must be composed of hays, grains, and the by-products of the various grains, with the elimination of all unnecessary or injurious substances. In order to secure the full benefit of the feeding stuff law, feeders must familiarize themselves with the meaning of the terms "protein," "fat," and so forth; they must read the information on the tax tags on the feeding stuffs they purchase, and understand the meaning of the guarantee thereon. Every feeder should know, for example, that cottonseed meal containing 49 per cent protein is worth more for feeding purposes than meal containing 44 per cent protein. Especially in the purchase

of mixed feeds, the feeder should carefully consider the analysis and the materials of which it is composed. The margin of profit in feeding is at best so small that the feeder should carefully consider the composition, digestibility and prices of the various feeding stuffs before determining which he shall buy.

Publications showing the digestibility of various ingredients, and therefore indicating the real value of different feeding stuffs, may be had upon application to the Director of the Experiment Station, College Station, Texas.

Definition of Terms.—The Texas feed law requires a guarantee of minimum percentages of protein, fat, nitrogen-free extract, and a maximum percentage of crude fiber.

The complete analysis of a feeding stuff gives its content of water, ash, protein, fat, crude fiber, and nitrogen-free extract, expressed in percentages.

Protein, being the constituent of food which forms flesh, muscle, hair, ligament and other portions of the animal body, is of great importance. It replaces the wear and tear of the animal tissue and furnishes material for additional flesh. Besides furnishing material for tissue, protein may be burned in the body to produce heat or it may serve as a source of fat in case of a deficiency in carbohydrates and fat accompanied by excess of protein. It is, however, a costly source of heat and fat.

Value of Protein: Protein is the most expensive portion of a feeding stuff, and feeding stuffs rich in protein usually sell for a higher price than feeding stuffs low in protein, though the difference is not as great in Texas as it is in the Northern States. With a given feeding stuff, the more protein it contains the better its quality, compared with other feeding stuffs of the same class. For example, cottonseed meal containing 48 per cent. protein is of better quality than cottonseed meal containing 45 per cent. protein. A low protein content accompanied by a high content of crude fiber indicates that the cottonseed meal contains an excessive amount of hulls.

We cannot, however, compare the value of feeding stuffs of different kinds on a protein basis alone. For example, a cottonseed meal containing 45 per cent. of protein does not have five times the value of corn chops containing 9 per cent. protein. There are other constituents of both feeding stuffs (fat and nitrogen-free extract), which are of value to the animal, and corn chops contains much more nitrogen-free extract than cottonseed meal. The digestibility of the constituents is also of importance. This is discussed in special bulletins of the Experiment Station, which may be had upon application to the director.

Fat (or Ether Extract) is composed mainly of fats and oils in the case of concentrated commercial feeding stuffs, but with fodders and hays it is often composed to a considerable extent of waxes, coloring matter, and other substances. Fat is used in the animal body as a source of body fat, and to furnish heat and energy. The animal requires heat to keep its body warm, and energy to run the animal

mechanism, or to do the outside work. The beating of the heart, chewing, movements of the intestines, and the involuntary muscular movements require energy which is furnished by the oxidation of fats, carbohydrates or protein. One pound of fat is equal to 2.25 pounds of carbohydrates.

Value of Fat: Fat ranks next to protein in value as a feeding constituent. The more protein and fat a given feeding stuff contains the better its quality compared with other feeding stuffs of the same class. Cottonseed meal containing 58 per cent. of protein and fat combined, is of higher value than cottonseed meal containing 50 per cent. of protein and fat combined. Cottonseed meal is indeed often sold on the basis of its protein and fat content, as determined by chemical analysis.

As with protein alone, however, two feeds of different kinds cannot be compared on the basis of their content of protein and fat, since other factors enter into consideration. These factors will be discussed later.

Crude Fiber is the proportion of the plant which resists the intense action of acids and alkalies. It consists mostly of the cell walls and woody fiber of the plant, and is the most indigestible part of the feeding stuff. By means of fermentation in the intestines, crude fiber is digested to some extent by animals which chew the cud. The operation, however, consumes so much energy that a large proportion of the value of the crude fiber is taken up by the process of digestion. Hays and fodders and other roughness generally contain much crude fiber, but concentrated feeding stuffs contain comparatively small quantities of it.

Value of Crude Fiber: Crude fiber is the woody and less digestible portion of a feeding stuff. The more crude fiber a feeding stuff contains the poorer its quality compared with other feeding stuffs of the same class. Feeding materials of low commercial value and of low value to the animal, such as straw, cottonseed hulls, rice hulls, oat hulls, corn cobs, and so forth, contain large quantities of crude fiber, and their addition to a concentrated feeding stuff increases its content of crude fiber. Thus, if the crude fiber in cottonseed meal exceeds certain limits, it indicates that the meal is adulterated with cottonseed hulls. In a similar way, crude fiber in excess of a given minimum indicates corn cobs or corn bran in corn chops; rice hulls in rice bran, and so on. The amount of crude fiber is much more sensitive indication of the low quality or of adulteration than the protein and fat, since the adulterants generally contain large percentages of crude fiber.

To repeat, the more crude fiber a feeding stuff contains the poorer its quality compared with other feeding stuffs of the same class. This also holds good in comparing feeding stuffs of different kinds, but not entirely; we must also consider the protein and fat content of the two kinds of feeding stuffs. Thus, wheat bran contains considerably more crude fiber than corn chops, but has a higher value when protein is worth more than fat and nitrogen-free extract.

Nitrogen-free Extract is composed of starch, sugar, dextrin, and other substances of a similar nature. These substances are mostly carbo-

hydrates; that is, they contain carbon and hydrogen and oxygen in proportions to form water. Crude fiber is also composed largely of carbohydrates.

Value of Nitrogen-free Extract: The nitrogen-free extract of most concentrated commercial feeding stuffs, such as corn chops, wheat bran, cottonseed meal, kafir, and so forth, is composed largely of sugars and starches which are readily digested and have considerable value to the animal.

The nitrogen-free extract of wheat skins, corn bran, corn cobs, rice hulls, hays and straws, and similar feeding stuffs, is composed mostly of other substances than sugar and starch, and has a lower value to animals. The nitrogen-free extract of these two kinds of feeding stuffs, therefore, cannot be compared directly.

In general, we may say that the more protein, fat and nitrogen-free extract, and the less crude fiber and ash, a given feed contains, compared with other feeding stuffs of the same kind, the better the quality.

The same statement also holds in comparing feeding stuffs of different kinds, but not altogether, since in comparing feeding stuffs of different kinds we must also consider the digestibility and the productive value of the digested materials.

Ash is the residue left when the plant is burned. It represents mostly the mineral portion of the plant and the portion which comes from the soil, although a part of the ingredients withdrawn from the soil are volatilized during combustion. Nitrogen particularly is driven out completely. Ash is valuable to the animal, inasmuch as it furnishes material for bone, and some constituents of it, particularly the phosphoric acid and sulphur, are essential constituents of the animal cell.

Value of Ash: Ash is necessarily present in feeding stuffs. An excessive amount indicates contamination with dirt, sand, or other mineral matter. Too little ash in the ration feed may give rise to disorders, especially in young animals.

Water (moisture) is always contained in feeding stuffs, but since it is furnished for the most part in liquid form it cannot be considered as having any special nutritive value.

Value of Water: The more water a feeding stuff contains the less of the other nutrients it contains, and the more liable it is to be injured by heating, mold, and so forth. The water content of feed varies, being larger in fresh grain.

Enforcement of the Law.—Enforcement of the feeding stuff law is a matter of protection to the feeder against adulteration with low grade feeding stuffs, and affords protection to honest dealers and manufacturers of feeding stuff against dishonest competition. When a feeding stuff is adulterated it is by means of the introduction of cheaper or low-grade materials. There is a tendency on the part of some manufacturers to lower the feeding value of feeding stuffs, for the purpose of reducing the price of a given product. Feed inspectors travel contin-

ously throughout the year, visiting all sections of the State, examining feeding stuffs for adulteration, false weights, untagged goods, and other violations; collecting information concerning feeding stuffs, giving information to the farmer, feeder and miller, and taking samples of feeding stuffs offered for sale. The samples collected are forwarded to the Feed Control Service, at College Station, and submitted to the State Chemist, who is chemist to the Feed Control Service. They are then submitted to physical and chemical analysis. If physical analysis shows the presence of adulterants the manufacturer or importer is notified that registration is cancelled, and he is no longer permitted to offer this product for sale until properly registered and tagged. Prosecution often follows.

Inspection samples are analyzed in the order in which they are received in the office, the purpose of analysis being to verify the guarantee made by the manufacturers and to see that they maintain the standard adopted for such feeding stuffs.

Complaints: Upon receiving a complaint that the feed law is being violated a thorough investigation is made, often necessitating sending an inspector to see the complainant. The inspector gathers evidence, reports fully to the office, and such action is then taken as will give justice to both miller and consumer.

What Has Been Accomplished.—Some of the results of the feed law are as follows:

(1) It has placed the feeding stuff trade on such a basis that mixtures of corn chops, wheat bran, wheat shorts, cottonseed meal, and other products with corn bran, screenage, sweepings, cottonseed hulls and such materials, are now sold *for what they really are*, and not as pure corn chops, wheat bran, cottonseed meal, and so forth.

(2) It has equalized and promoted uniformity in the selling price of feeding stuffs.

(3) It has induced farmers and feeders to investigate the relative values of feeding stuffs, and has thus increased the sale of feeding stuffs of known value.

(4) It has prevented the sale of a number of worthless feeding stuffs.

(5) It has encouraged the manufacturers to maintain a high standard.

(6) It has prevented the shipment into the State of inferior feeding stuffs, barred from other States that have feeding stuff laws.

(7) It has prevented the sale of adulterated feeds as pure products.

Co-operation with the United States Department of Agriculture.—On March 9, 1912, the Director received a commission from the United States Department of Agriculture to collect samples of feeding stuffs and other products as defined in the Texas feeding stuffs law, which are manufactured or offered for sale in the District of Columbia or in any State or Territory of the United States, or which shall be offered for sale in unbroken packages in any State other than that in which they shall have been respectively manufactured or purchased, for examina-

tion under the direction or supervision of the Bureau of Chemistry, at Washington, D. C.

By means of this appointment the Director of the Experiment Station and his assistants are authorized to procure samples under the Federal Food and Drugs Act without the necessity of waiting, as previously, for the services of a Federal inspector, and by this commission we are in a much better position to control interstate shipments and protect the purchaser who buys feeding stuffs manufactured outside of the State of Texas.

Relation to the Experiment Station.—The Texas Agricultural Experiment Station is carrying on investigations of the chemical composition, digestibility and nutritive values of feeding stuffs. It is also conducting feeding experiments at College Station, and at other points in the State. The Feed Control Service, therefore, is in the position to secure expert advice and assistance with respect to various problems arising under the operation of the law. The Veterinary Division of the Experiment Station, for example, has tested various feeding stuffs suspected of having caused the death of live stock by poisoning. The Division of Chemistry has made a study of the moisture in corn chops as related to the spoiling of this product—a matter which has caused great losses during years past, especially during the spring of 1912. The Division of Chemistry has also investigated and still has under investigation various methods for the examination of feeding stuffs with respect to adulteration. The connection with the Experiment Station is thus of advantage both to the Feed Control Service and to the Experiment Station. The Feed Control Service brings various problems to the attention of the Experiment Station which require solution.

Bulletins of the Feed Control Service are sent out by the Experiment Station from time to time. These publications are sent free upon application.

Educational Value of Feed Control Service.—When the feed law first went into effect in Texas most of the millers knew very little of the composition of feeding stuffs. Analyses were made for the purpose of complying with the law by chemists who had little knowledge of feeding stuffs, whatever their qualifications. The results of some of these analyses were very surprising indeed. The Feed Control Service thus had, in the beginning, considerable educational work to do among the manufacturers, supplying them with various information in regard to the law and the composition and nature of feeding stuffs. Many millers were not permitted to make guarantees which they could not possibly maintain. At the present time the manufacturers have become more or less familiar with the law, the chemical analyses of feeding stuffs and their significance, but there is much educational work to be done among the feeders. The Feed Control Service, therefore, includes in its bulletins information concerning the protein, fat and other constituents of feeding stuffs, and other information concerning the nature and value of the various feeding stuffs, and endeavors to circulate its bulletins as widely as possible among the farmers and feeders of the State, so that they may have information concerning feeding stuffs in

general, and the specific feeding stuffs in particular available in various markets of the State.

Standards and Definitions.—The law empowers the Director of the Experiment Station to adopt names, standards and definitions for feeding stuffs. He may refuse the registration of any feeding stuff under a name which would be misleading as to the materials of which it is made, or which does not conform to the standards and definitions adopted. If a feeding stuff is registered and then discovered to be in violation of the standards and definitions adopted, the director has the power to cancel registration after ten days' notice.

Feeding stuffs cannot be sold under names that are false or misleading. Should the manufacturer desire to use a name not included in the list herein given, it will be well for him to correspond with the Feed Control Service before making application for registration.

The following standards and definitions have been adopted:

ALFALFA PRODUCTS.

Alfalfa Meal is the entire alfalfa hay finely ground, and must not contain an admixture of ground alfalfa straw or other foreign materials. It must contain not less than 12 per cent. of protein, 1 per cent. of fat, and not more than 28 per cent. of crude fiber.

CORN PRODUCTS.

Corn Chops consists of the pure grain of corn from sound seed and good quality, chopped. It must contain not less than 9 per cent. of protein, 3.50 per cent. of fat, and not more than 3 per cent. of crude fiber.

Earn Corn Chops is husked corn and cob chopped with not a greater proportion of cob than occurs in the ear corn in its natural state. It must contain not less than 8 per cent. of protein, 3 per cent. of fat, and not more than 8 per cent. of crude fiber. The percentages of grain and cob must be shown on the tax tag.

Ear Corn Meal corresponds to ear corn chops. The percentages of grain and cob must be shown on the tax tag.

Corn Bran is the outer covering of the corn grain, and must contain not less than 8 per cent. of protein, 3 per cent. of fat, and not more than 12 per cent. of crude fiber.

Hominy Feeds, Hominy Meal or Hominy Chops is a mixture of the bran coating, the germ and a part of the starchy portion of the corn kernel obtained in the manufacture of hominy grits for human consumption. It must contain not less than 10 per cent. of protein, 10 per cent. of fat, and not more than 7 per cent. of crude fiber.

Corn Feed Meal is the by-product obtained in the manufacture of cracked corn, or table meal from the whole grain of corn. It must contain not less than 8 per cent. of protein, 3 per cent. of fat, and not more than 4 per cent. of crude fiber.

COTTONSEED PRODUCTS.

Cottonseed Products are classified as follows:

1. Choice Cottonseed Meal, or Cottonseed Cake.
2. Prime Cottonseed Meal, or Cottonseed Cake.
3. Cold Pressed Cottonseed.

(a) Choice.

(b) Prime.

Cottonseed Meal and Hulls.

Choice Cottonseed Meal is composed of the decorticated kernels of cottonseed, free from excess of hulls and other foreign materials. It must be finely ground, of sweet odor, reasonably bright in color, and must contain not less than 48 per cent. of protein, or not less than 55 per cent. of protein and fat combined, and not more than 9 per cent. of crude fiber.

Prime Cottonseed Meal is composed of the decorticated kernels of cottonseed, free from excess of hulls and other foreign materials. It must contain not less than 44 per cent. of protein, or not less than 51 per cent. of protein and fat combined, and not more than 11 per cent. of crude fiber.

Cottonseed Cake shall correspond to cottonseed meal in composition and as to standard.

Note.—Any deficiency in the percentage of fat may be offset by additional percentage of protein, as, for instance, in cottonseed meal guaranteed to contain 5 per cent. of fat, 46 per cent. of protein would be required in order that the combined amount of protein and fat be 51 per cent.

Choice Cold Pressed Cottonseed is the product resulting from subjecting the whole, sound, mature, clean undecorticated cottonseed to the cold pressure process for the extraction of oil and includes the entire cottonseed less the lint, and the oil extracted. It must contain not less than 28 per cent. of protein.

Prime Cold Pressed Cottonseed is the product resulting from subjecting the whole, sound, mature, clean undecorticated cottonseed to the cold pressure process for the extraction of oil and includes the entire cottonseed less the lint, and the oil extracted. It must contain not less than 25 per cent. of protein.

Ground Cold Pressed Cottonseed is cold pressed cottonseed, ground. It must correspond to cold pressed cottonseed in composition and as to standards.

Cottonseed Meal and Hulls is composed of the decorticated kernels of sound cottonseed containing less than 44 per cent. of protein. The percentage of meal and the percentage of hulls must be shown on the tag.

Cottonseed Cake and Hulls shall correspond to cottonseed meal and hulls in composition as to standard.

FETERITA PRODUCTS.

Feterita Chops consists of the entire grain removed from the head and chopped. It must contain not less than 11 per cent. of protein, 2.75 per cent. of fat, and not more than 3 per cent. of crude fiber.

Feterita Head Chops consists of the entire head, chopped. It must contain not less than 10 per cent of protein, 2.75 per cent. of fat, and not more than 7.50 per cent. of crude fiber.

KAFIR PRODUCTS.

Kafir Chops consists of the entire grain removed from the head and chopped. It must contain not less than 9 per cent. of protein, 2.50 per cent. of fat, and not more than 3.50 per cent. of crude fiber.

Kafir Head Chops consists of the entire head, chopped. It must contain not less than 8 per cent. of protein, 2.50 per cent. of fat, and not more than 8 per cent. of crude fiber.

MILO PRODUCTS.

Milo Chops consists of the entire grain removed from the head and chopped. It must contain not less than 9 per cent. of protein, 2.50 per cent. of fat, and not more than 3.50 per cent. of crude fiber.

Milo Head Chops consists of the entire head, chopped. It must contain not less than 8 per cent. of protein, 2.50 per cent. of fat, and not more than 8 per cent. of crude fiber.

PEANUT PRODUCTS.

Peanut Cake is the residue after the extraction of part of the oil by pressure or solvents from peanut kernels. It must contain not less than 45 per cent. of protein, 7 per cent. of fat, and not more than 9 per cent. of crude fiber.

Peanut Meal is the ground residue after the extraction of part of the oil by pressure or solvents from peanut kernels. It must contain not less than 45 per cent. of protein, 7 per cent. of fat, and not more than 9 per cent. of crude fiber.

Whole Pressed Peanut Cake is the residue obtained after extraction of part of the oil from whole peanuts, and the ingredients shall be designated as "Peanut Cake with Hulls." It must contain not less than 36 per cent. of protein, 6 per cent. of fat, and not more than 20 per cent. of crude fiber.

Whole Pressed Peanut Meal is the ground residue obtained after extraction of part of the oil from whole peanuts, and the ingredients shall be designated as "Peanut Meal with Hulls." It must contain not less than 36 per cent. of protein, 6 per cent. of fat, and not more than 20 per cent. of crude fiber.

RICE PRODUCTS.

Rice Bran is the cuticle of the rice grain, with only such quantity of hulls as is unavoidable in the regular milling of rice. It must contain not less than 11 per cent. of protein, 10 per cent. of fat, and not more than 15 per cent. of crude fiber.

Rice Polish is the finely powdered material secured in polishing rice. It must contain not less than 11 per cent. of protein, 6 per cent. of fat, and not more than 4 per cent. of crude fiber.

SORGO PRODUCTS.

Sorgo Chops consists of the entire grain removed from the head and chopped. It must contain not less than 8 per cent. of protein, 2.50 per cent. of fat, and not more than 3 per cent. of crude fiber.

Sorgo Head Chops consists of the entire head, chopped. It must contain not less than 8 per cent. of protein, 2.50 per cent. of fat, and not more than 8 per cent. of crude fiber.

WHEAT PRODUCTS.

Wheat Bran is the coarse outer coating of the wheat kernel as separated from cleaned and scoured wheat in the usual process of commercial milling, and must contain not less than 14.50 per cent. of protein, 3 per cent. of fat, and not more than 10 per cent. of crude fiber.

Wheat Bran and Screenings is the coarse outer coating of the wheat kernel as separated from cleaned and scoured wheat in the usual process of commercial milling plus the various impurities separated from the wheat during the cleaning process, and known collectively as *Screenings*, and must contain not less than 14.50 per cent. of protein, 3 per cent. of fat, and not more than 10 per cent. of crude fiber. This product must not contain more than 8 per cent. of screenings.

Standard Wheat Shorts is the fine particles of the outer bran, the inner of "be wing" bran, germ, and the offal or fibrous material obtained in the last reductions of middlings, and must contain not less 15 per cent. of protein, 3.50 per cent. of fat and not more than 5 per cent. of crude fiber.

Wheat Brown Shorts as compared with standard wheat shorts contain mostly the fine particles of bran and germ, and contain much less of fibrous offal obtained from the "tail of the mill," and must contain not less than 15 per cent. of protein, 3.50 per cent. of fat, and not more than 6 per cent. of crude fiber.

Wheat White Shorts as compared with standard wheat shorts shall contain a smaller portion of the fine bran particles and germ and much greater portion of the fibrous offal from the "tail of the mill," and must contain not less than 14.50 per cent. of protein, 3 per cent. of fat, and not more than 3.50 per cent. of crude fiber.

If to any of the above brands of shorts there should be added, either

ground or unground, bolted or unbolted, the various impurities separated from the wheat during the cleaning process and known collectively as Screenings, the same shall be registered, labeled, and sold as Wheat Shorts and Screenings. Wheat Brown Shorts and Screenings; or Wheat White Shorts and Screenings, as the case may be, and each must equal the guarantee required for the pure product.

Wheat Screenings shall consist of the smaller, imperfect grains, weed seeds and other foreign materials having a feeding value, separated in cleaning the grain. (Sand, dirt or other substances without feeding value must be eliminated from screenings before they are added to any feed.)

Recleaned Wheat Screenings shall consist of the smaller, imperfect grains of wheat after all weed seeds and other foreign materials have been removed.

The word *Screenings* shall appear as part of the label or brand name that is required, and shall be printed in the same size and face of type as the remainder of the label. For example, "WHEAT BRAN AND SCREENINGS," and not "WHEAT BRAN and screenings."

Wheat Mixed Feed shall consist of wheat bran and wheat shorts combined in the proportions obtained in the usual process of commercial milling, and must contain not less than 16 per cent. of protein, 3.50 per cent. of fat, and not more than 8.50 per cent. of crude fiber. The name of each ingredient, for example, wheat bran, wheat shorts, should also be given on the tag. (This feed has commonly been known as Mill Run or Mill Run Bran.)

Wheat Mixed Feed and Screenings shall consist of the wheat bran and wheat shorts to which have been added the various impurities separated from wheat during the cleaning process and known collectively as *Screenings*. The name of each ingredient—wheat bran, wheat shorts and wheat screenings—and the maximum percentage of screenings, which is 8 per cent., shall appear on the tag. This product must contain not less than 16 per cent. of protein, 3.50 per cent. of fat, and not more than 8.50 per cent. of crude fiber.

Wheat Chops is the entire berry of sound wheat, chopped. It must contain not less than 14 per cent. of protein, 2 per cent. of fat, and not more than 5 per cent. of crude fiber.

MIXED PRODUCTS.

Mixed Bran consists of a mixture of wheat bran and corn bran, or rice bran. It must not contain any materials *not bran*. The composition must be shown on the tax tag.

Corn Bran and Wheat Bran or Wheat Bran and Corn Bran consists of a mixture of corn bran and wheat bran, and the composition must be shown on the tax tag.

Mixed Feed is a mixture of wholesome feeding stuffs. The name and percentage of each ingredient used in the feeding stuff must be

stated in the registration. If corn cobs, ground hay, rice hulls, oat hulls, or similar materials are present in the feeding stuff, *the name of each ingredient, and the percentages of each ingredient must also be shown on the tax tag.*

Poultry Feed is a mixed feed, and is no exception to the names, definitions and standards set forth in this bulletin. If grit, oyster shell, charcoal or similar substances be added to this product, it must be shown in the name of the feed. For example, "*Poultry Feed With Grit.*" Not more than 2 per cent. of grits or similar materials are permitted to be added to poultry feed.

Any other names must have the approval of the Feed Control Service.

ADULTERANTS.

Any feeding stuff which contains corn cobs, peanut hulls, rice hulls, oat hulls, chaff, ground hay or straw, roughage, or any other material of low feeding value, is considered as adulterated. The percentage of each ingredient of such adulterated feeding stuff must be stated on the registration form and on tags to be attached to such products.

GROUND RICE HULLS.

In many instances manufacturers in this and other States have been using ground rice hulls extensively as an ingredient in their various mixed feeds. We give below some facts concerning the feeding value of this material.

Dr. G. S. Fraps, State Chemist, and Chemist to the Experiment Station, has the following to say as to the feeding value of rice hulls:

"In view of the fact that rice hulls is now being used in some mixed feeds, it is well to call attention to its feeding value. Rice hulls contains about 0.3 digestible protein in 100 pounds, which is about one-tenth of the digestible protein in Johnson grass hay, about one-thirty-sixth of the quantity in wheat bran, and about one-one-hundred twentieth of the quantity in cottonseed meal. Ground rice hulls has a productive value of approximately 3.2 per cent. That is to say, 100 pounds of ground rice hulls fed to an animal receiving enough feed for maintenance will produce 3.2 pounds of fat. This is about two-fifths of the productive value of Johnson grass hay; one-fourth of the productive value of wheat bran, and one-sixth of the productive value of cottonseed meal. Rice hulls has a much lower feeding value than any hay, straw or fodder now being used for feeding purposes in the State of Texas. It can, in no sense, be regarded as a concentrated feeding stuff; but, on the contrary, it is even inferior to the poorest roughage ordinarily used, such as rice straw, wheat straw, or corn cobs. For these reasons, rice hulls cannot be regarded as a very desirable addition to a mixed feed, as it acts chiefly as a filler and has very little feeding value."

Dr. W. A. Henry, formerly Dean of the College of Agriculture and Director of the Agricultural Experiment Station, University of Wisconsin, in his book entitled "Feeds and Feeding," says:

"The hulls of rice grains are tasteless, tough, and woody. They are

also heavily charged with silica or sand, and have sharp, roughened flinty edges and needle-like points which do not soften in the digestive tracts, and so are irritating and dangerous to the walls of the stomach and intestines. The Louisiana Station reports cases of vomiting and death with cattle fed rice hulls. Rice hulls should never be fed to farm animals, yet they have been extensively employed by unscrupulous dealers for adulterating commercial feeding stuffs. Such use should be prohibited by law, since rice hulls in any form are worse than worthless."

In view of the foregoing statements, feeders should inform themselves as to the composition of all mixed feeds. This can be done by examining the tag attached, which gives the composition of all mixed feeds, and where an adulterant is present the percentages of all ingredients are given.

TENTATIVE GUARANTEE FOR A FEED.

The following table shows a tentative guarantee which may be used in registering feed stuffs with the Feed Control Service. The guarantees suggested below are based on actual analyses made by our Chemist during the past five years, and should be used by manufacturers in registering a given feed:

Name of Feedstuff.	Crude Protein not less than per cent.	Crude Fat not less than per cent.	Nitrogen- Free Extract not less than per cent.	Crude Fiber not more than per cent.
Alfalfa Meal.....	13.50	1.50	36.00	30.00
Barley Chops.....	11.00	1.50	65.00	6.00
Beet Molasses.....	9.00		59.00	
Beet Pulp.....	0.75		6.00	2.50
Blood Dried.....	84.00	2.50		
Brewers' Grain, dried.....	24.00	6.00	40.00	18.00
Corn Bran.....	9.00	5.00	63.00	10.00
Corn Chops.....	9.50	3.50	70.00	3.00
Corn Cob.....	2.00	1.50	54.00	31.00
Corn Feed Meal.....	9.00	4.00	67.00	4.00
Corn, Ear Chops.....	8.00	3.00	64.00	7.50
Corn, Ear Chops with Shuck.....	7.75	2.75	62.00	10.00
Corn Germ Meal.....	10.00	3.50	66.00	5.00
Cottonseed Cake.....	44.00	7.50	24.00	10.50
Cottonseed Chops.....	23.00	20.00	25.00	18.00
Cottonseed, Cold Pressed.....	26.00	7.00	28.00	26.00
Cottonseed, Cold Pressed (ground).....	26.00	7.00	28.00	26.00
Cottonseed Hulls.....	3.00	1.25	28.00	51.00
Cottonseed Meal.....	44.00	7.50	24.00	10.50
Feterita Chops.....	11.00	2.50	69.00	3.00
Feterita Head Chops.....	10.00	2.50	64.00	8.50
Hominy Feed.....	9.00	6.00	60.00	7.00
Kafir Chops.....	10.50	2.75	69.50	3.00
Kafir Head Chops.....	9.50	2.50	65.00	8.00
Linseed Meal, new process.....	33.00	3.00	38.00	10.00
Linseed Meal, old process.....	32.00	7.50	35.00	9.00
Meat Scraps.....	65.00	13.00	2.50	3.00
Meat Meal.....	65.00	13.00	2.50	3.00
Millet Seed.....	11.00	4.00	57.00	10.00
Milo Chops.....	10.00	2.50	71.00	3.00
Milo Head Chops.....	9.75	2.40	65.00	7.50
Milo Head Stems (Ground).....	4.72	1.24	26.29	53.10
Molasses, black strap.....	2.40		65.00	
Oats, ground.....	11.00	4.00	58.00	10.00
Oat Hulls.....	3.00	1.00	51.00	30.00
Peanut Meal.....	45.00	7.00	23.00	9.00
Peanut Cake.....	45.00	7.00	23.00	9.00
Rice Bran.....	12.00	11.00	42.00	15.00
Rice Polish.....	12.00	7.00	60.00	3.50
Rice, ground rough.....	7.00	1.75	63.00	10.00
Rice Hulls.....	3.00	.50	37.00	36.00
Rye Chops.....	10.00	1.50	72.00	2.00
Sorgo Chops.....	9.50	3.00	69.00	3.00
Sunflower Seed.....	16.00	21.00	21.00	30.00
Wheat Bran.....	15.00	3.50	54.00	9.00

Name of Feedstuff.	Crude Protein not less than per cent.	Crude Fat not less than per cent.	Nitrogen- Free Extract not less than per cent.	Crude Fiber not more than per cent.
Wheat Chops.....	15.00	2.00	65.00	3.50
Wheat Mixed Feed.....	16.00	3.60	55.00	8.00
Wheat Shorts, Standard.....	17.00	3.80	60.00	4.50
Whole Pressed Peanut Meal.....	36.00	6.00	23.00	20.00
Whole Pressed Peanut Cake.....	36.00	6.00	23.00	20.00

Tentative Guarantee for a Mixed Feed.—In order to arrive at a guarantee for a mixed feed, it is necessary that the percentage of each ingredient be known. For instance, a mixed feed is composed of 50 per cent. Corn Chops and 50 per cent. Wheat Bran. The percentage of protein in Corn Chops is 9.00; thus 50 per cent. of this feed would be 4.50, and the percentage of Protein in Wheat Bran is 14.50; thus 50 per cent. of this feed would be 7.25; therefore, the percentage of Protein in the mixed feed would be 4.50 plus 7.25, or 11.75. This method may be continued throughout to find the different percentages for each content. In case more than two feeds enter into the mixture, the same procedure may be used in ascertaining a guarantee, only, of course, using the exact percentage of the different ingredients each time instead of 50 per cent., as above.

Redemption of Tags.—When tags are printed in error, or if for any reason not in correct form, they will be redeemed by the Feed Control service at their full value less the original cost of the tags. In sending tags to us for redemption, you should make shipment by prepaid express, writing the Feed Control Service at the time you make the shipment, stating the number and denomination of tags you are sending and enclose express receipt.

Name of Millrun Bran Changed.—The term "Millrun Bran" in connection with registering this product is no longer permitted. The term "Wheat Mixed Feed" is now used to designate this product. When filling out registration forms for this product, please bear this in mind.

Name of Milo and Kafir Products Changed.—Because of the fact that the correct designation of Milo and Kafir products heretofore referred to as "Milo Maize" and "Kafir Corn" are "Milo" and "Kafir," one "f" has been dropped from the word "Kafir," and the words "corn" and "maize" have been omitted from the two names. Manufacturers are requested to conform to these changes in the names of their Kafir and Milo products. Registrations are not permitted to read "Kafir or Milo"; they may, however, read "Kafir and Milo," and in this instance the feed referred to MUST contain both products.

PRICE LIST OF TAX TAGS.

5 pound tags	\$.25 per M
6½ pound tags .....	.31½ per M
8½ pound tags .....	.41½ per M
10 pound tags .....	.50 per M
12½ pound tags .....	.62½ per M

16 $\frac{1}{2}$ pound tags	.....	.83 $\frac{1}{2}$ per M
25 pound tags	.....	1.25 per M
50 pound tags	.....	2.50 per M
75 pound tags	.....	3.75 per M
100 pound tags	.....	5.00 per M
125 pound tags	.....	6.25 per M
143 pound tags	.....	7.15 per M
150 pound tags	.....	7.50 per M
167 pound tags	.....	8.35 per M
175 pound tags	.....	8.75 per M
200 pound tags	.....	10.00 per M

HOW TO REMIT FOR TAGS.

In ordering tags please send Money Order, Certified Check or Bank Exchange. Under the provisions of the law personal checks cannot be accepted. In case it is not convenient to remit as suggested above, tags may be sent C. O. D.

PRINTING OF TAGS.

The Feed Control Service will, under no circumstances, print tags, but for the convenience of the manufacturers this work may be done by the printing concerns in Bryan, Texas. The Feed Control Service will have this printing done only on request from the manufacturer.

In case the tags are to be printed by Bryan concerns, do not include in money order, certified check or bank draft, sent in payment of tags, the charge for the printing. Remit separately to the printers for charges covering printing or allow the printers to bill you direct.

ALPHABETICAL LIST OF MANUFACTURERS REGISTERED.

The following is an alphabetical list of all firms registered with the Feed Control Service. By noting the address of any given firm, then referring to the following pages showing the analyses, the different feeds manufactured by any registered firm may be found:

Aaron, T. M., Quail, Texas.
 Abbott, E. C., Caldwell, Texas.
 Abernathy Corn Mill, Abernathy, Texas.
 Abernathy, E. M., Lexington, Oklahoma.
 Abilene Flour Mills Company, Abilene, Kansas.
 Abilene Milling Company, Abilene, Kansas.
 Acme Mill, Houston, Texas.
 Acme Milling Company, Oklahoma City, Oklahoma.
 Acme Roller Mills, Leonard, Texas.
 Ada Milling Company, Ada, Oklahoma.
 Aetna Mill and Elevator Company, Wellington, Kansas.
 Ahrenbeck Mill & Manufacturing Company, Navasota, Texas.
 Ahrenbeck Vehicle Company, Navasota, Texas.
 Ainsa, M., & Sons, Inc., El Paso, Texas.
 Alamo Oil & Refining Company, San Antonio, Texas.

Alfalfa Meal and Milling Company, Cherokee, Oklahoma.
 Alfalfa Milling Company, Byron, Oklahoma.
 Alfalfa Milling Company, Hobart, Oklahoma.
 Alice Cotton Oil Company, Alice, Texas.
 Allen, E. A., Groesbeck, Texas.
 Allen, G. M., Hermleigh, Texas.
 Alliance Milling Company, Denton, Texas.
 Allneda Mills Company, East St. Louis, Illinois.
 Alto Cotton Oil Company, Alto, Texas.
 Altus Alfalfa Milling Company, Altus, Oklahoma.
 Alva Roller Mills, Alva, Oklahoma.
 Alvarado Cotton Oil Mill, Alvarado, Texas.
 Alvin Mercantile Company, Alvin, Texas.
 Amarillo Commercial Company, Amarillo, Texas.
 American Alfalfa Food Company, Wichita, Kansas.
 American Beet Sugar Company, Chino, California.
 American Brewing Association, Houston, Texas.
 American Coal & Grain Company, Amarillo, Texas.
 American Hominy Company, St. Joseph, Missouri.
 American Rice Milling Company, Crowley, Louisiana.
 American Seed Company, Fort Worth, Texas.
 Amsler's, C., Estate, Hempstead, Texas.
 Anadarko Milling Company, Anadarko, Oklahoma.
 Anaheim Sugar Company, Anaheim, California.
 Anchor Mills, Waco, Texas.
 Anderson, Will C., Winnsboro, Texas.
 Anderson Brothers Roller Mills, Cleburne, Texas.
 Anderson County Cotton Oil Company, Palestine, Texas.
 Anderson & Hannah Mill Company, Sulphur, Oklahoma.
 Anderson, O. T., & Company, Olney, Texas.
 Andrews, W. A., Eliasville, Texas.
 Andrews, W. A., & Sons, Necessity, Texas.
 Anson Milling Company, Anson, Texas.
 Apache Cotton Oil and Manufacturing Company, Chickasha, Oklahoma.
 Apache Milling Company, Apache, Oklahoma.
 Appleby, W. O., Carnegie, Oklahoma.
 Arapaho Mill and Elevator Company, Arapaho, Oklahoma.
 Ardmore Milling Company, Ardmore, Oklahoma.
 Archer Grain & Lumber Company, Purcell, Oklahoma.
 Arendell Brothers, Stephenville, Texas.
 Arizona Alfalfa Mill Company, Phoenix, Arizona.
 Arkansas City Milling Company, Arkansas City, Kansas.
 Arkansas Milling Company, Denton, Texas.
 Arlington, Light, Power, Ice & Water Company, Arlington, Texas.
 Arkadelphia Milling Company, Arkadelphia, Arkansas.
 Armengol, J., Laredo, Texas.
 Armour Fertilizer Works, Fort Worth, Texas.
 Arnold, H. G., Silvertown, Texas.
 Artesia Alfalfa Milling Company, Artesia, New Mexico.
 Ashby & Sons, Leavenworth, Kansas.

Ashgrove Milling Company, Ashgrove, Missouri.
Athens Cotton Oil Company, Athens, Texas.
Atlanta Rice Mills Company, Beaumont, Texas.
Atlas Oats Company, Kansas City, Missouri.
Aubrey Milling Company, Aubrey, Texas.
Aunt Jemima Mills Company, St. Joseph, Missouri.
Aurora Milling Company, Aurora, Missouri.
Austin Oil Manufacturing Company, Austin, Texas.
Austin Mill and Grain Company, Brownwood, Texas.
Austwell Oil Mill, Austwell, Texas.

Baden-Vilm Milling Company, Winfield, Kansas.
Badge-Johnson Company, Burnet, Texas.
Baker, J. W., Conroe, Texas.
Baker Brothers, Prosper, Texas.
Baker, J. I., Gin and Mill Company, Purcell, Oklahoma.
Ball and Gunning Milling Company, Webb City, Missouri.
Ballinger Cotton Oil Company, Ballinger, Texas.
Balzer Brothers, Sagerton, Texas.
Bardwell Cotton Oil Company, Bardwell, Texas.
Barnes, John R., Estelline, Texas.
Barteldes Seed Company, Oklahoma City, Oklahoma.
Bartlett Oil Mills, Bartlett, Texas.
Barton County Flour Mills, Great Bend, Kansas.
Barrett, C. W., and Son, Temple, Texas.
Barry Grain Company, Navasota, Texas.
Barry Milling Company, Barry, Texas.
Barwell, J. W. (Blatchford Calf Meal Factory), Waukegan, Illinois.
Bastrop Milling Company, Bastrop, Texas.
Bates, James A., Leonard, Texas.
Battern, F. H., Decatur, Texas.
Bawden, D., & Son, Yukon, Oklahoma.
Bay City Grain Company, Bay City, Texas.
Bay City Rice Milling Company, Bay City, Texas.
Beasley, D. C., Arthur City, Texas.
Beatrice Corn Mills, Lincoln, Nebraska.
Beatrice Milling Company, Whitewright, Texas.
Beaumont Cotton Oil Mill Company, Beaumont, Texas.
Beaumont Rice Mill, Beaumont, Texas.
Becker and Company, Brenham, Texas.
Becker, John, Company, Belen, New Mexico.
Beeville Cottonseed Oil Mill Company, Beeville, Texas.
Bell Grain Company, Crowell, Texas.
Bells Mill and Grain Company, Bells, Texas.
Bellville Cotton Oil Company, Bellville, Texas.
Belton Mill and Grain Company, Belton, Texas.
Belton Oil Company, Belton, Texas.
Bencini Cotton Oil Mills, Brady, Texas.
Bencini Cotton Oil Mills, Brownwood, Texas.
Bencini Cotton Oil Mills, Coleman, Texas.

Bencini Cotton Oil Mills, Dublin, Texas.
Bencini Cotton Oil Mills, Hamilton, Texas.
Bencini Cotton Oil Mills, Hico, Texas.
Bencini Cotton Oil Mills, Stephenville, Texas.
Bennett, E. W., and Son, Fort Stockton, Texas.
Bennett, S. J., Sunset, Texas.
Bennett-Sims Mill and Elevator Company, Clarendon, Texas.
Bennington Grain and Elevator Company, Bennington, Oklahoma.
Benson, T. L., Eldorado, Texas.
Bernheimr Marcus Flour Mill, Clinton, Missouri.
Berry, D. C., St. Jo, Texas.
Berry, J. W., Snyder, Texas.
Berryman and Watters, Alto, Texas.
Besterio, M., Brownsville, Texas.
Bewley Mills, Fort Worth, Texas.
Bias, R. B., Fuel Company, El Paso, Texas.
Bigham, H. V., Roaring Springs, Texas.
Bidning-Stephens Grain Company, Tulsa, Oklahoma.
Binger Elevator Company, Binger, Oklahoma.
Bishop Manufacturing Company, Bishop, Texas.
Bissett, H. J., Skidmore, Texas.
Black, J. W., Justin, Texas.
Black and Braly, Leonard, Texas.
Black Brothers, Beatrice, Nebraska.
Blair Elevator Company, Atchinson, Kansas.
Blair Milling Company, Atchinson, Kansas.
Blackwell Mill and Elevator Company, Blackwell, Oklahoma.
Blackwell Grain Company, Blackwell, Oklahoma.
Blaine County Mill and Elevator Company, Geary, Oklahoma.
Blanchett, H. S., Beaumont, Texas.
Blanco Roller Mills and Gin Company, Blanco, Texas.
Bleich, M. N., Galveston, Texas.
Blooming Grove Cotton Oil Company, Blooming Grove, Texas.
Blossom Oil and Cotton Company, Blossom, Texas.
Blount, D. E., Pittsburg, Texas.
Blue Jacket Grain Company, Blue Jacket, Oklahoma.
Blum Roller Mills Company, Blum, Texas.
Bogatto, A. L., Lamarque, Texas.
Bolin-Hall Milling Company, Liberal, Kansas.
Bolton, J. L., Grabel, Texas.
Booth, F. I., Booth, Texas.
Border Queen Milling Company, Caldwell, Kansas.
Boren, J. R., Tulia, Texas.
Boston, H. B. & W. M., Arlington, Texas.
Bovina Mercantile Company, Bovina, Texas.
Bower, Louis, Graham, Texas.
Bowers and Vinson, Tahoka, Texas.
Bowersock Mill and Power Company, Lawrence, Kansas.
Bowie Cotton Oil and Gin Company, Bowie, Texas.
Bowie County Cotton Oil Company, New Boston, Texas.

Boyce, M. C., Utopia, Texas.
Boyd, J. W., Grain and Commission Company, Joplin, Missouri.
Boyd-Gunning Milling Company, Webb City, Missouri.
Boyd and Brigmore, Sarcoxie, Missouri.
Bradfish, H. J., Weatherford, Texas.
Bradshaw, A. C., Marlin, Texas.
Bradshaw, R. E., Grain Company, Houston Heights, Texas.
Brady, P. L., Jr., Hearne, Texas.
Brady Oil Company, Brady, Texas.
Bramblett, T. L., Alvarado, Texas.
Brand Dunwoody Milling Company, Joplin, Missouri.
Brashear, L. C., Sunset, Texas.
Brazoria Grain Company, Brazoria, Texas.
Brazos Valley Cotton Oil Company, Waco, Texas.
Breckenridge Milling and Gin Company, Breckenridge, Texas.
Brenham Bottling Works, Brenham, Texas.
Brenham Compress Oil and Manufacturing Company, Brenham, Texas.
Brennand, W. H., Seminole, Texas.
Brent Brothers, Dodd City, Texas.
Brewer, A. E., Denton, Texas.
Brice-Burnett and Company, Snyder, Texas.
Bridges, C. H., and Company, Waco, Texas.
Bridges, H. S., Roby, Texas.
Broadmoor Ranch, Wills Point, Texas.
Brock, J. W., Grapevine, Texas.
Brode, W. F., and Company, Dallas, Texas.
Brooks and Woodruff, Southmayd, Texas.
Brown, Harry, Whitewright, Texas.
Brown, R. L., Rockwall, Texas.
Brown and Dishman, Bellevue, Texas.
Brown Grain Company, McKinney, Texas.
Brownwood Oil Mill, Brownwood, Texas.
Bruceville Oil Company, Bruceville, Texas.
Bryan Cotton Oil and Fertilizer Company, Bryan, Texas.
Buchel Milling Company, Cuero, Texas.
Buda Milling Company, Buda, Texas.
Buden-Vilm Milling Company, Winfield, Kansas.
Buhler Mill and Elevator Company, Buhler, Kansas.
Bulte Mills, Kansas City, Missouri.
Bunch, T. H., Commission Company, Little Rock, Arkansas.
Burt Grain Company, St. Joseph, Missouri.
Burleson Mill and Elevator Company, Burleson, Texas.
Burnett, W. F., Little Robe, Oklahoma.
Burnett Roller Mills, Burnet, Texas.
Burns, W. B., Big Springs, Texas.
Burrus Mill and Elevator Company, Fort Worth, Texas.
Burson, J. R., Silvertown, Texas.
Burson and King, Georgetown, Texas.
Burton Cotton Oil Company, Burton, Texas.

Bussey, C. H., Hutchins, Texas.
Byars Cotton Oil Company, Byars, Texas.
Caddo Cotton Oil Company, Shreveport, Louisiana.
Caddo Milling Company, Caddo, Oklahoma.
Cage, D. S., and Company, Houston, Texas.
Cairo Milling Company, Cairo, Illinois.
Cain, E. H., Bartlett, Texas.
Cane Milling Company, Atchinson, Kansas.
Caldwell, F. L., Mertzon, Texas.
Caldwell, E. W., Stratford, Texas.
Caldwell Milling Company, Caldwell, Kansas.
Caldwell Oil Mill Company, Caldwell, Texas.
Cameron Cotton Oil Company, Cameron, Texas.
Campbell-Sims Company, Paris, Texas.
Camp Springs Mill Company, Nashville, Illinois.
Canadian Implement Company, Canadian, Texas.
Canadian Mill and Elevator Company, El Reno, Oklahoma.
Canton Milling Company, Canton, Kansas.
Cape County Milling Company, Jackson, Missouri.
Capitol City Mills, Austin, Texas.
Capitol Grain and Elevator Company, Oklahoma City, Oklahoma.
Carlock, M. D., Winnsboro, Texas.
Carlock and Russell, Winnsboro, Texas.
Carmichael, W. D., Nocona, Texas.
Carmine Cotton Oil and Manufacturing Company, Carmine, Texas.
Carmoda, Nicola, Hearne, Texas.
Carney Milling Company, Carney, Texas.
Carroll, W. J., Kerens, Texas.
Carruthers, A. B., Rochester, Texas.
Carson, A. M., Willis, Texas.
Carter Grain Company, Bay City, Texas.
Carthage Cotton Oil Company, Carthage, Texas.
Carson, L. C., Cleburne, Texas.
Caudle, M. C., Dorchester, Texas.
C. C. Milling Company, Waxahachie, Texas.
Celina Mill and Elevator Company, Celina, Texas.
Center Cotton Oil Company, Center, Texas.
Center Point Roller Mills, Center Point, Texas.
Chalfant Grain Company, Clinton, Oklahoma.
Chambers-Winsett Brothers, Higgins, Texas.
Chamberlain, F. B., Company, St. Louis, Missouri.
Chance, C. E., Shamrock, Texas.
Chandler and Norris, Graham, Texas.
Chandler, J. M., Sutherland Springs, Texas.
Channing Mercantile and Banking Company, Channing, Texas.
Chapin and Company, Hamond, Indiana.
Chapman Milling Company, Sherman, Texas.
Charleston Milling Company, Charleston, Missouri.
Checotah Mill and Elevator Company, Checotah, Oklahoma.

Chenoweth, E. B., Grain Company, Dallas, Texas.
Cherokee Mill and Elevator Company, Cherokee, Kansas.
Chickasha Cotton Oil Company, Chickasha, Oklahoma.
Chickasha Milling Company, Chickasha, Oklahoma.
Childress Grain Company, Temple, Texas.
Cia Harinera del Norte E. C. L., Porfiro Dia Coah., Mexico.
Cisco Oil Mill, Cisco, Texas.
Citizens Cotton Oil Company, Cumby, Texas.
Citizens Cotton Oil Company, Taylor, Texas.
Citizens Mill and Brokerage Company, Seguin, Texas.
Citizens Cotton Oil Company, Lancaster, Texas.
Citizens Independent Mill and Elevator Company, Weatherford, Oklahoma.
City Feed Store, Kingsville, Texas.
City Mill and Light Company, Royse City, Texas.
City Grain and Feed Company, Kingsville, Texas.
City Mill, Ennis, Texas.
City Mill and Elevator Company, Emporia, Kansas.
Cia Industrial Jabonera de la Laguna, S. A. Gomez Placio, Dgo., Mexico.
Clafin Mill and Elevator Company, Clafin, Kansas.
Clarendon Grain Company, Clarendon, Texas.
Clark, John H., Clarendon, Texas.
Clark-Lynn Grain Company, Texarkana, Texas.
Clarkson Milling Company, Winfield, Texas.
Clarksville Cotton Oil Company, Clarksville, Texas.
Clay County Cotton Oil Company, Henrietta, Texas.
Cleburne Grain and Seed Company, Cleburne, Texas.
Cleburne Oil Mill Company, Cleburne, Texas.
Cleburne Peanut and Products Company, Cleburne, Texas.
Clemens Grain Company, Waco, Texas.
Clinton Alfalfa Mill, Clinton, Oklahoma.
Clifton Mill and Elevator Company, Clifton, Texas.
Clopton, A. M., Elgin, Texas.
Cobb, L. G., Citrus Grove, Texas.
Cobb Grain Company, Plainview, Texas.
Cochran, H. K., Little Rock, Arkansas.
Cokes, H. T., Crisp, Texas.
Cole, H. C., Milling Company, Chester, Illinois.
Cole, H. W., Oklahoma City, Oklahoma.
Cole, R. L., and Company, Krum, Texas.
Coleman, E. T., Plainview, Texas.
Coleman Grain and Mercantile Company, Coleman, Texas.
Coleman Milling Company, Coleman, Texas.
Collin County Mill and Elevator Company, McKinney, Texas.
Collin and Morton, Weir, Texas.
Colorado Valley Rice Milling Company, Bay City, Texas.
Comanche Cotton Oil Company, Comanche, Texas.
Comanche Grain and Elevator Company, Comanche, Oklahoma.
Comanche Milling Company, Comanche, Texas.
Comfort Roller Mills, Comfort, Texas.

Commerce Oil Mill, Commerce, Texas.
 Commonwealth Feed Mill Company, St. Louis, Missouri.
 Conkey, G. E., and Company, Cleveland, Ohio.
 Conklin, W. T., Grain Company, Kaw City, Oklahoma.
 Consolidated Alfalfa Milling Company, Newton, Kansas.
 Continental Oil and Cotton Company, Abilene, Texas.
 Continental Oil and Cotton Company, Colorado, Texas.
 Cooper Cotton Oil Company, Cooper, Texas.
 Cooper, J. W., Wortham, Texas.
 Cornbelt Grain Company, Atchinson, Kansas.
 Cornforth Grain Company, Waco, Texas.
 Corno Mills, East St. Louis, Illinois.
 Corpus Christi Cotton Oil Company, Corpus Christi, Texas.
 Cottonseed Products Company, Roff, Oklahoma.
 Cowen, J. C., Grain Company, Tulia, Texas.
 Cowgill and Hill Milling Company, Carthage, Missouri.
 Cox, H. M., Milling Company, Killeen, Texas.
 Cox Campbell Grain Company, Frederick, Oklahoma.
 Cozart, C. B., Higgins, Texas.
 Cozart, C. B., Woodward, Oklahoma.
 Cranston, Oliver, Houston, Texas.
 Cranz and Keffler, Schulenburg, Texas.
 Crescent Mill and Elevator Company, Denver, Colorado.
 Crist, Andrew, O., Pond Creek, Oklahoma.
 Crosby Roller Mills, Topeka, Kansas.
 Cross Plain Gin Company, Cross Plain, Texas.
 Crouch Grain Company, Fort Worth Texas.
 Crouch, H. H., Grain Company, Waco, Texas.
 Crown Mill Company, Belleville, Illinois.
 Crystal Ice Company, Fort Worth, Texas.
 Crystal Palace Flour Mill, Weatherford, Texas.
 Cudahy Packing Company, Chicago, Illinois.
 Cuero Cotton Oil and Manufacturing Company, Cuero, Texas.
 Cunningham Commission Company, Little Rock, Arkansas.
 Curlin Brothers, Nacona, Texas.
 Curtis, S. W., Pearsall, Texas.
 Custer Milling Company, Custer City, Oklahoma.
 Cyphers Incubator Company, Dallas, Texas.
 Daingerfield Cotton Oil Company, Daingerfield, Texas.
 Dallas Brewery, Dallas, Texas.
 Dallas Corn Mills, Dallas, Texas.
 Dallas Oil and Refining Company, Dallas, Texas.
 Daly, Bob, Presidio, Texas.
 Dandee Feed and Milling Company, San Antonio, Texas.
 Darby, Son and Higginbotham, Snyder, Texas.
 Darling and Company, Chicago, Illinois.
 Darragh Warehouse Company, Little Rock, Arkansas.
 Davidson Feed Store, Lubbock, Texas.
 Davidson Mill and Elevator Company, Muskogee, Oklahoma.

Davis, J. E., Milford, Texas.
Davis, J. H., Elevator Company, Knox City, Texas.
Davis, W. E., Alvin, Texas.
Davison and Company, Galveston, Texas.
Dawe, Tom, and Son, Gonzales, Texas.
Dawson, J. C., Snyder, Texas.
Dawson Milling Company, Dawson, Texas.
Dawson Oil Mill, Dawson, Texas.
Dazey Moore Grain Company, Fort Worth, Texas.
Decatur Grain Company, Decatur, Texas.
Decker and Frierson, Haskell, Texas.
DeKalb Milling Company, DeKalb, Texas.
DeLong, R. S., and Sons, Newcastle, Texas.
Delphos Milling Company, Delphos, Kansas.
Denison Mill and Grain Company, Denison, Texas.
Denton Grain Company, West, Texas.
Denton Milling Company, Denton, Texas.
Denton Oil and Gin Company, Denton, Texas.
Denver Alfalfa Milling and Products Company, Hartman, Colorado.
Depauw, J. M., Quail, Texas.
Deport Cottonseed Oil Company, Deport, Texas.
Detroit Oil and Cotton Company, Detroit, Texas.
Deverux Brothers, Jacksonville, Texas.
Dew Brothers Company, Inc., Dewalt, Texas.
Diamond Mill Company, Sherman, Texas.
Dickie, R. L., Mereta, Texas.
Dickson and Orr, Memphis, Texas.
Dicago, Migul, Del Rio, Texas.
Diller, R. W., Midlothian, Texas.
Dittlinger, H., Roller Mills Company, New Braunfels, Texas.
Dixie Mills Company, East St. Louis, Illinois.
Dixon, E. S., and Company, Houston, Texas.
Dodd, J. N., Lone Oak, Texas.
Dodge City Milling Company, Dodge City, Kansas.
Doggett Grain Company, Dallas, Texas.
Doggett and Palmers, Ravenna, Texas.
Doherty and Johnson, Shreveport, Louisiana.
Donnell Brothers and Company, Eliasville, Texas.
Dorsey Grain Company, Weatherford, Texas.
Dowlin, W. H., and Sons, Byers, Texas.
Dowlin, W. H., and Sons, Windom, Texas.
Drake and Son, Alvin, Texas.
Driskell, W. J., Woodward, Oklahoma.
Drozd and Parma, Penelope, Texas.
Dublin Mill and Elevator Company, Dublin, Texas.
Dugat and Lampton, Beeville, Texas.
Duke, C. W., Arlington, Texas.
Duncan Milling Company, Duncan, Oklahoma.
Dunlaney, W. H., Leaky, Texas.
Durant Cotton Oil Company, Durant, Oklahoma.

Durant Grain and Elevator Company, Durant, Oklahoma.
Durant Mill and Elevator Company, Durant, Oklahoma.
Durant Milling Company, Durant, Oklahoma.

Eagle Mill and Elevator Company, Higginsville, Texas.
Eagle Milling Company, Newton, Kansas.
Early and Clement Grain Company, Waco, Texas.
Early Grain and Elevator Company, Amarillo, Texas.
East El Paso Fuel Company, El Paso, Texas.
Eastern Grain Company, San Angelo, Texas.
East Texas Mill and Elevator Company, Longview, Texas.
Eaton Milling and Elevator Company, Eaton, Colorado.
Eddy Milling Company, Eddy, Texas.
Edwards Grain and Elevator Company, Floydada, Texas.
Edwards Brothers, Tahoka, Texas.
Edwards, J. F., Grandview, Texas.
Edwardsville Milling Company, Edwardsville, Illinois.
Eggers Milling Company, Hermann, Missouri.
Eidelbach, G. S., Flatonia, Texas.
Eiland, Enoch, Lakeview, Texas.
Eisenneyer Milling Company, Springfield, Missouri.
Elam, C. L., Pearl, Texas.
El Campo Cotton Oil Company, El Campo, Texas.
El Campo Rice Milling Company, El Campo, Texas.
Excelsior Milling and Elevator Company, Denver, Colorado.
Electric Corn Mill, Corsicana, Texas.
Elgin Cotton Oil Company, Elgin, Texas.
Elkin, E. C., Randlett, Oklahoma.
Elk City Cotton Oil Company, Elk City, Oklahoma.
Elk City Flour and Mills Company, Elk City, Oklahoma.
Elk City Mill and Elevator Company, Elk City, Oklahoma.
Ellison, H. W., Beasley, Texas.
Elliott and Myers, Superior, Nebraska.
Ellsworth Mill and Elevator Company, Ellsworth, Kansas.
Ellzey, D. G., Goodnight, Texas.
El Paso Grain Company, El Paso, Texas.
El Paso Grain and Milling Company, El Paso, Texas.
El Paso Refining Company, El Paso, Texas.
El Reno Alfalfa Milling Company, El Reno, Oklahoma.
El Reno Mill and Elevator Company, El Reno, Oklahoma.
Elwood Grain Company, St. Joseph, Missouri.
Ellzey, B. G., Goodnight, Texas.
Empire Milling Company, Newton, Kansas.
Empire Rice Mills Company, New Orleans, Louisiana.
Enid Mill and Elevator Company, Enid, Oklahoma.
Ennis Cotton Oil Company, Ennis, Texas.
Enns Milling Company, Inman, Kansas.
Erick Milling Company, Erick, Oklahoma.
Ervine, J. E., and Company, Houston, Texas.
Erwin Mill and Elevator Company, Byers, Texas.

Estey and Skwortz Milling Company, Leming, Texas.
Estelline Milling Company, Estelline, Texas.
Estelline Milling Company, Estelling, Texas.
Estrado, Francisco P., Eagle Pass, Texas.
Eufala Elevator and Grain Company, Eufala, Oklahoma.
Evrage, Will H., Rising Star, Texas.
Excello Feed Milling Company, St. Joseph, Missouri.
Excelsior Mill, Burlington, Kansas.
Excelsior Milling and Elevator Company, Denver, Colorado.

Fairview Milling Company, Fairview, Oklahoma.
Fannin Mill, Fannin, Texas.
Farmers Cotton Oil Company, Celina, Texas.
Farmers Cotton Oil Company, Farmersville, Texas.
Farmers Cotton Oil Company, Kosse, Texas.
Farmers Cotton Oil Company, Wichita Falls, Texas.
Farmers Cotton Oil Company, Winnsboro, Texas.
Farmers District Union Mill and Electric Company, O'Brien, Texas.
Farmers Elevator Company, Electra, Texas.
Farmers Elevator Company, Iowa Park, Texas.
Farmers Gin Company, Foreston, Texas.
Farmers Gin Company, Lone Oak, Texas.
Farmers Gin and Elevator Company, Durant, Oklahoma.
Farmers Gin and Milling Company, Waxahachie, Texas.
Farmers Gin Company, Cross Plain, Texas.
Farmers and Ginners Cotton Oil Company, Austin, Texas.
Farmers and Ginners Cotton Oil Company, Sulphur Springs, Texas.
Farmers Grain and Elevator Company, Groom, Texas.
Farmers Mill, McGregor, Texas.
Farmers Mill and Elevator Company, Enid, Oklahoma.
Farmers Mill and Elevator Company, Hastings, Oklahoma.
Farmers Mill and Elevator Company, Watongo, Oklahoma.
Farmers Milling and Mercantile Company, Berthoud, Colorado.
Farmers Oil and Fertilizer Company, Texarkana, Texas.
Farmers Union Mercantile Company, Snyder, Texas.
Farmers Rice Milling Company, Eagle Lake, Texas.
Farmers Shipping Association, Canadian, Texas.
Farmersville Mill and Light Company, Farmersville, Texas.
Fiest, M., Rowena, Texas.
Ferguson, A. M., Sherman, Texas.
Ferris Ranch Gin, Weinert, Texas.
Ferguson, Joe Lee, Hale Center, Texas.
Fest and Trawalter, San Antonio, Texas.
Fick, Williams and Sons, Bleiblerville, Texas.
Fidelity Cotton Oil and Fertilizer Company, Houston, Texas.
Finch, J. R., Ginsight, Texas.
Findley, John T., Gasolene, Texas.
Fisher, F. E., Carlton, Texas.
Fitzgerald, T. F., Bangs, Texas.
Flatonia Oil Mill, Flatonia, Texas.

Fleming, J. F., Osage, Texas.
Florence Mill Company, Florence, Texas.
Floresville Oil and Manufacturing Company, Floresville, Texas.
Forbes Milling Company, Archer City, Texas.
Forney Cotton Oil and Gin Company, Forney, Texas.
Fort Bend Cotton Oil Company, Richmond, Texas.
Fort Collins Milling and Elevator Company, Fort Collins, Colorado.
Fort Worth Cotton Oil Mill, Fort Worth, Texas.
Fort Worth Elevator Company, Fort Worth, Texas.
Foster Brothers, Byars, Oklahoma.
Fouke Milling and Grain Company, Texarkana, Arkansas.
Fowler Commission Company, Kansas City, Missouri.
Fred Brothers, Eden, Texas.
French, W. A., Co., Kaufman, Texas.
Frerisha, G. G., Travis, Texas.
Frio Cotton Oil Co., Pearsall, Texas.
Frisco Grain & Elevator Co., Frisco, Texas.
Frisco Milling Company, Frisco, Texas.
Fritsch, A., Hempstead, Texas.
Frizzell & Geeslin, Goldthwaite, Texas.
Fuller Cotton Oil Company, Snyder, Texas.
Fuller Grain Company, Seymour, Texas.
Fulton, J. A., Lometa, Texas.

Gage Roller Mills, Gage, Oklahoma.
Gage Roller Mills, Higgins, Texas.
Gains Brothers, Fairland, Oklahoma.
Galena Mill and Elevator Company, Galena, Kansas.
Gainesville Cotton Oil Company, Gainesville, Texas.
Ganado Mill and Elevator Company, Ganado, Texas.
Garber Milling Company, Garber, Oklahoma.
Garfield County Milling Company, Enid, Oklahoma.
Garland Cotton Oil Company, Garland, Texas.
Garlington Grocery Company, Bowie, Texas.
Garza Mill Company, Garza, Texas.
Garza, V. de la, Chihuahua, Mexico.
Gaskins, George, and Son, Dublin,
Gatesville Cotton Oil Mill, Gatesville, Texas.
Gatesville Roller Mills, Gatesville, Texas.
Geary Milling Company, Geary, Oklahoma.
Geary Milling and Elevator Company, Geary, Oklahoma.
Gegenworth, George, Columbus, Texas.
Georgetown Corn Mill, Georgetown, Texas.
Georgetown Oil Mill, Georgetown, Texas.
Gerlach Higgins Milling Company, Higgins, Texas.
Gibbons, J. T., New Orleans, Louisiana.
Gibbs, T. W., Burnet, Texas.
Gibson Gin and Oil Company, Calvert, Texas.
Giddings Cotton Oil Company, Giddings, Texas.
Giddings Industrial Co-operation, Giddings, Texas.

Giles, Thomas, Amarillo, Texas.
Gilland, Charles H., Franklin, Texas.
Gilliand, G. W., Abilene, Texas.
Gilmer Cottonseed Oil Company, Gilmer, Texas.
Gladney Milling Company, Sherman, Texas.
Glasgow Milling Company, Glasgow, Missouri.
Glacier Mill and Elevator Company, Glacier, Texas.
Glenrose Roller Mills, Glenrose, Texas.
Godley Mill and Elevator Company, Godley, Texas.
Goerke & Loewen, Durham, Oklahoma.
Golden Grain Milling Company, East St. Louis, Illinois.
Gomez Mill and Gin Company, Gomez, Texas.
Gonzales Cotton Oil and Manufacturing Company, Gonzales, Texas.
Goodlander Milling Company, Fort Scott, Kansas.
Gordan, J. S., and Company, Beaumont, Texas.
Gorvin Flour and Grain Company, Wichita, Kansas.
Gorvin, H. W., Wichita, Kansas.
Gossett Brothers, Taylor, Texas.
Graham, E. V., and Company, Odessa, Texas.
Graham Cotton Oil Company, Graham, Texas.
Graham Mill and Elevator Company, Graham, Texas.
Grain Products Company, Wichita, Kansas.
Granbury Cotton Oil Company, Granbury, Texas.
Granbury Milling Company, Granbury, Texas.
Grand Prairie Mill and Elevator Company, Grand Prairie, Texas.
Grandview Cotton Oil Mill, Grandview, Texas.
Granger Milling Company, Granger, Texas.
Granger Oil Mill, Granger, Texas.
Grapevine Roller Mills, Grapevine, Texas.
Graves and McWhorter, Lubbock, Texas.
Green and Wright, Cage, Oklahoma.
Greenville Cotton Oil Company, Greenville, Texas.
Greenville Mill and Elevator Company, Greenville, Texas.
Greenville Mill and Elevator Company, Commerce, Texas.
Greer, H. C., Austin, Texas.
Greer Moore Elevator Company, Anna, Texas.
Gregory, C. W., Killeen, Texas.
Greening Brothers, Lehigh, Kansas.
Gruver, J. H., Lockney, Texas.
Guenther Milling Company, San Antonio, Texas.
Gulf Coast Rice Mills, Houston, Texas.
Guthrie and Company, Superior, Nebraska.
Guthrie Cotton Oil Company, Guthrie, Oklahoma.
Guthrie Mill and Elevator Company, Guthrie, Oklahoma.

Hall Baker Grain Company, Kansas City, Missouri.
Hall, C. C., Grain Company, Purcell, Oklahoma.
Hall and Shorts, Rochester, Texas.
Halliday, H. L., Milling Company, Cairo, Illinois.
Halsell Arlidge Cattle Company, Maryneal, Texas.

Halstead Milling and Elevator Company, Halstead, Kansas.
Hambleton Custom Mills, Weatherford, Texas.
Hamilton and Groves, Brownfield, Texas.
Hamilton Mill and Elevator Company, Hamilton, Texas.
Hamlin Cotton Oil Company, Hamlin, Texas.
Hamlin Elevator Company, Hamlin, Texas.
Hammer, B. L., Plainview, Texas.
Hampton Brothers Milling Company, Lafontaine, Kansas.
Hanna Pate Grain Company, Joplin, Missouri.
Harden, A. J., Water Valley, Texas.
Hardin, Samuel, Grain Company, Kansas City, Missouri.
Hardie, David, Seed Company, Dallas, Texas.
Hargrove, John T., Muskogee, Oklahoma.
Hargrove, J. H., Sandia, Texas.
Harley, H. L., Weatherford, Texas.
Harper Mill and Elevator Company, Harper, Kansas.
Harrison, E. W., Hereford, Texas.
Harsh Brothers and Company, St. Louis, Missouri.
Hartley Grain and Fuel Company, Hartley, Texas.
Harvest Queen Mill, Plainview, Texas.
Hastings Hardware Company, Hastings, Oklahoma.
Haucks Elevator Company, Valley Falls, Kansas.
Haven Milling Company, Haven, Kansas.
Hayes Grain and Commission Company, Little Rock, Arkansas.
Hays City Milling and Elevator Company, Hays City, Kansas.
Hays, C. C., Liberty, Texas.
Head, D., and Sons, Durant, Oklahoma.
Headrick Grain Company, Sweetwater, Texas.
Hedley Milling Company, Hedley, Texas.
Heffron and Company, Galveston, Texas.
Hefley Company, Fort Worth, Texas.
Heflin, R. L., Galveston, Texas.
Heidenreich, J. G., Kyle, Texas.
Helena Milling Company, Helena, Oklahoma.
Henderson Cotton Oil and Gin Company, Henderson, Texas.
Henrietta Elevator Company, Henrietta, Texas.
Henrietta Milling Company, Henrietta, Texas.
Hicks, W. H., Canyon, Texas.
Higgins Grain Company, Higgins, Texas.
Higgins Mill and Elevator Company, Higgins, Texas.
Higginbotham Brothers and Company, Comanche, Texas.
Higginsville Milling Company, Higginsville, Texas.
Highland Roller Mills, Salado, Texas.
Hill, J. E., Midland, Texas.
Hill County Cotton Oil Company, Hillsboro, Texas.
Hill Milling Feed and Fuel Company, Lubbock, Texas.
Hill and Webb, McKinney, Texas.
Hillje Brothers, Weimar, Texas.
Hillman, Charles, Talferner, Texas.

Hobart Mill and Elevator Company, Hobart, Oklahoma.
Hoffman, C., and Sons Milling Company, Enterprise, Kansas.
Hogan Hayden and Company, Pryor, Oklahoma.
Hogan Milling Company, Junction City, Kansas.
Holdenville Grain and Produce Company, Holdenville, Oklahoma.
Holekamp and Son, Comfort, Texas.
Holland-O'Neal Milling Company, Mount Vernon, Missouri.
Hollis Cotton Oil, Light and Ice Company, Hollis, Oklahoma.
Holloway, J. W., Hondo, Texas.
Homan, F., Luling, Texas.
Hondo Gin and Mill Company, Hondo, Texas.
Honey Grove Cotton Oil Company, Honey Grove, Texas.
Hopps and Maddox, Woodward, Oklahoma.
Horn and Allen, Channing, Texas.
Hornsby, N. M., Hadley, Texas.
House, R. J., and Company, Kansas City, Missouri.
Houston County Oil Mill and Manufacturing Company, Crockett, Texas.
Houston Cotton Meal Mill, Houston, Texas.
Houston Cotton Oil Mill, Houston, Texas.
Houston Grain Company, Houston, Texas.
Houston Ice and Brewing Company, Houston, Texas.
Houston-Lichnovsky Gin Company, Floresville, Texas.
Houston Milling Company, Houston, Texas.
Houston Packing Company, Houston, Texas.
Howard, E. R. T., and Company, Brownsville, Texas.
Howard, H. Hanks, Company, Chicago, Illinois.
Howe Grain and Mercantile Company, Howe, Texas.
Hubbard City Mill and Elevator Company, Hubbard City, Texas.
Hubbard Oil Company, Hubbard City, Texas.
Huckabee, J. E., Leonard, Texas.
Huggins-Andrew Company, Childress, Texas.
Hughes, J. A., Howe, Texas.
Hughley, Amos, Plano, Texas.
Hughston Grain Company, Plano, Texas.
Hugo Milling Company, Hugo, Oklahoma.
Humphrey Grain Company, Canadian, Texas.
Humphrey, D. W., Cattle Company, Fort Worth, Texas.
Humphreys-Godwin and Company, Memphis, Tennessee.
Hungarian Milling and Elevator Company, Denver, Colorado.
Hunt County Oil Company, Wolfe City, Texas.
Hunt, J. C., Grain Company, Wichita Falls, Texas.
Hunter Milling Company, Wellington, Kansas.
Hunter-Robison-Wens Milling Company, St. Louis, Missouri.
Huntsville Cotton Oil Company, Huntsville, Texas.
Huntsville Milling Company, Huntsville, Texas.
Hurley, H. H., Clinton, Missouri.
Huskey, L. E., Moran, Texas.
Husler Mill and Elevator Company, Salt Lake City, Utah.
Hutcherson Grain and Elevator Company, Roff, Oklahoma.

Hutchins, J. B., Navasota, Texas.
 Hutchinson Flour Mills Company, Hutchinson, Kansas.
 Hutchison, O. W., Shattuck, Oklahoma.

 Imboden Milling Company, Wichita, Kansas.
 Imbs, J. F., Milling Company, Bellville, Illinois.
 Imperial Mercantile Company, Sugarland, Texas.
 Imperial Rice Company, Houston, Texas.
 Imperial Valley Oil and Cotton Company, El Centro, California.
 Independent Cotton Oil Company, Bruceville, Texas.
 Industrial Cotton Oil Company, Galveston, Texas.
 Industrial Cotton Oil Properties, Denison, Texas.
 Industrial Cotton Oil Properties, Hearne, Texas.
 Industrial Cotton Oil Properties, Houston, Texas.
 Industrial Cotton Oil Properties, Seguin, Texas.
 Industrial Cotton Oil Properties, Waco, Texas.
 Industrial Mill, Houston, Texas.
 Inmon and Gregory, Kerens, Texas.
 Internation Sugar Feed No. 2 Company, Memphis, Tennessee.
 Italy Cotton Oil Company, Italy, Texas.
 Itasca Cotton Oil Company, Itasca Texas.
 Itasca Roller Mills and Elevator Company, Itasca, Texas.

 Jacksboro Mill and Elevator Company, Jacksboro, Texas.
 Jacksboro Oil and Milling Company, Jacksboro, Texas.
 Jackson Brothers, Lubbock, Texas.
 Jackson, H. M., Sunset, Texas.
 Jackson, Henry, Boyd, Texas.
 Jackson, O. P., and Company, Houston, Texas.
 Jackson and Mitchell, Weir, Texas.
 Jacksonville Cotton Oil Company, Jacksonville, Texas.
 Jacksonville Grain and Commission Company, Jacksonville, Texas.
 Jefferson Oil Company, Jefferson, Texas.
 Jennings Brothers, Houston, Texas.
 Johnson City Roller Flour Mills, Johnson City, Texas.
 Johnson, E., Hubbard City, Texas.
 Johnson, W. S., Tahoka, Texas.
 Johnson Gin Company, Wills Point, Texas.
 Jonah Roller Mills, Jonah, Texas.
 Josey-Miller Company, Beaumont, Texas.
 Joyce, J. R., Mount Vernon, Texas.
 Justin Mill and Elevator Company, Justin, Texas.

 Kammerdiener, Frank, Oklahoma City, Oklahoma.
 Kansas Flour Mills Company, Kansas City, Missouri.
 Kansas Milling Company, Wichita, Kansas.
 Katy Grain Company, Kansas City, Kansas.
 Katy Milling Company, Caddo, Oklahoma.
 Katy Rice Milling Company, Katy, Texas.
 Kaufman Cotton Oil Company, Kaufman, Texas.

Keel and Son, Gainesville, Texas.
Kell Milling Company, Vernon, Texas.
Kelly Milling Company, Kansas City, Missouri.
Kelly, A. V., Kirvin, Texas.
Kelly, W. M., Milling Company, Hutchinson, Texas.
Kelley, W. R., and Company, Santa Anna, Texas.
Kelly and Beece, Canyon, Texas.
Kelly Mill and Elevator Company, Pond Creek, Oklahoma.
Kemper Grain Company, Coffeyville, Kansas.
Kemper Mill and Elevator Company, Kansas City, Missouri.
Kemper Mill and Elevator Company, Tonganoxie, Kansas.
Kenedy Cotton Oil Company, Kenedy, Texas.
Kenedy Feed Company, Kenedy, Texas.
Kennedy, L. D., Abilene, Texas.
Kerens Cotton Oil Company, Kerens, Texas.
Kerrville Roller Mills, Kerrville, Texas.
Key and Key, Lamesa, Texas.
Kidder, R. E., Flour Mills, Kansas City, Missouri.
Kiddo Milling Company, Coffeyville, Kansas.
Kimball-Sawyer Milling Company, Kansas City, Missouri.
King, Calvin, Alvord, Texas.
King, J. W., Sipe Springs, Texas.
King, W. J., Bartlett, Texas.
King Grocery Company, Teague, Texas.
Kingfalfa Mills, Nebraska City, Nebraska.
Kingfisher Mill and Elevator Company, Kingfisher, Oklahoma.
Kingsville Cotton Oil Mill Company, Kingsville, Texas.
Knaur Grain Company, Denison, Texas.
Knox City Cotton Oil Mill, Knox City, Texas.
Knox County Elevator Company, Munday, Texas.
Knuth, H., Floresville, Texas.
Kornfalfa Feed Milling Company, Kansas City, Missouri.
Kothmann, F. A., Llano, Texas.
Kracke, J. H., Milling Company, Clinton, Missouri.
Kraft and Madero, El Paso, Texas.
Krempitz, Charles, Sealy, Texas.
Kress Mill, Kress, Texas.
Krueger, Emil, New Ulm, Texas.
Kuhlman and Meyers, California, Missouri.
Kutzer, Albert, Boerne, Texas.
Kyle Oil and Gin Company, Kyle, Texas.

Ladonia Cotton Oil Company, Ladonia, Texas.
La Grange Cotton Oil and Manufacturing Company, La Grange, Texas.
La Grange Gin and Milling Company, La Grange, Texas.
LaGunta Mill and Elevator Company, LaGunta, Colorado.
Lake Charles Grain Company, Lake Charles, Louisiana.
Lake Charles Rice Milling Company, Lake Charles, Louisiana.
Lakeside Rice Mill Company, Lakeside, Texas.
Lamar Cotton Oil Company, Harris, Texas.

Lamar Milling and Elevator Company, Lamar, Colorado.
Lamont Alfalfa Milling Company, Lamont, Oklahoma.
Lampasas Milling Company, Lampasas Texas.
Land, Mos H., Milling Company, Marshall, Missouri.
Land Milling Company, Neodesha, Kansas.
Landa Cotton Oil Company, New Braunfels, Texas.
Landa Flour Mills, New Braunfels, Texas.
Lane and Lorentzen, El Paso, Texas.
Larabee Flour Mills Company, Hutchinson, Kansas
Laredo Roller Mills, Laredo, Texas.
Larowe Milling Company, Detroit, Michigan.
Larowe Milling Company, Los Angeles, California.
Lassen, P., Roanoke, Texas.
Lavaca Oil Company, Hallettsville, Texas.
Lawrence Brothers, Crowley, Louisiana.
Lawrence and Hamilton Feed Company, New Orleans, Louisiana.
Lawrence Grain and Milling Company, Checotah, Oklahoma.
Lawther Grain Company, Dallas, Texas.
Lawton Mill and Elevator Company, Lawton, Oklahoma.
Leavell, J. G., Company, Gatesville, Texas.
Leavenworth Milling Company, Leavenworth, Kansas.
Lee, R. I., Rising Star, Texas.
Lee County Co-operative Association, Giddings, Texas.
Lee County Cotton Oil Company, Giddings, Texas.
Lee Grain and Elevator Company, C. S., Abilene, Texas.
Lee-Warren Milling Company, Salina, Kansas.
Leger Mill Company, Altus, Oklahoma.
Lehman, George W., Rosebud, Texas.
Lehman, W. P. L., Corpus Christi, Texas.
Lemons Grain and Coal Company, Amarillo, Texas.
Leonard Cotton Oil Company, Leonard, Texas.
Leon Gin and Milling Company, Leon, Oklahoma.
Leon Mercantile Company, Buffalo, Texas.
LeTulle Mercantile Company, Bay City, Texas.
Levita Roller Mills, Levita, Texas.
Levy, Julius, Houston, Texas.
Levy Rice Milling Company, New Orleans, Louisiana.
Lewis, A. S., Dallas, Texas.
Lewis, D. L., Sanger, Texas.
Lewis, Oak, Blanket, Texas.
Lewisville Cotton Oil Company, Lewisville, Texas.
Lexington Flouring Mills, Lexington, Missouri.
Liard, J. P., Uvalde, Texas.
Lightfoot, W. C., DeLeon, Texas.
Lilienthal Bros., Houston, Texas.
Lillard Milling Company, Decatur, Texas.
Lindsay Brothers, Houston, Texas.
Lindsborg Milling and Elevator Company, Lindsborg, Kansas.
Linton Grain Company, Chickasha, Oklahoma.
Live Oak Farm, Muldoon, Texas.

Livingston Manufacturing Company, Livingston, Texas.
Lock, C. E., Running Water, Texas.
Lockhart Oil and Gin Company, Lockhart, Texas.
Lockhart Oil and Refining Company, Lockhart, Texas.
Lockney Coal and Grain Company, Lockney, Texas.
Llano County Farmers Union Warehouse Company, Llano, Texas
Logsdon and Son, Andrews, Texas.
Lone Oak Oil and Gin Company, Lone Oak, Texas.
Lone Star Brewing Company, San Antonio, Texas.
Lone Star Milling and Grain Company, Prosper, Texas.
Long, John Y., Del Rio, Texas.
Longenberg Milling Company, Republic, Missouri.
Longmont Farmers Milling and Elevator Company, Denver, Colorado.
Longmont Farmers Milling and Elevator Company, Longmont, Colorado.
Longmont Flour Milling Company, Longmont, Colorado.
Longview Cotton Oil Company, Longview, Texas.
Loomis, J. A., Mereta, Texas.
Lorenz and Geis, Cordell, Oklahoma.
Louisiana Cotton Oil Company, Shreveport, Louisiana.
Louisiana Grain and Milling Company, Lake Charles, Louisiana.
Louisiana State Rice Milling Company, New Orleans, Louisiana.
Love, A. J., DeLeon, Texas.
Love and Cobb, Blessing, Texas.
Loveland Milling and Elevator Company, Loveland, Colorado.
Loven, John, Clyde, Texas.
Lubbock Grain and Coal Company, Lubbock, Texas.
Lukens Milling Company, Atchinson, Kansas.
Luling Oil and Manufacturing Company, Luling, Texas.
Lyons Milling Company, Lyons, Kansas.
Lyon Oil Mill Company, Lyon, Texas.
Lysle, J. C., Milling Company, Leavenworth, Kansas.

McAdams, E. D. and J. D., Clarendon, Texas.
McAdams, T. J., Celina, Texas.
McAdams, Y. O., Kinnard, Texas.
McAteer Grain Company, Lott, Texas.
McCarty Shivers Grain Company, Rosebud, Texas.
McClung and Gober, Jacksonville, Texas.
McComb, J. R., Lampasas, Texas.
McCully and Company, Brownwood, Texas.
McDaniel Milling Company, Carthage, Missouri.
McEwin Grain Company, Kansas City, Missouri.
McFadden Rice Milling Company, Beaumont, Texas.
McGinty, John T., Navasota, Texas.
McGregor Milling and Grain Company, McGregor, Texas.
McGregor Oil and Manufacturing Company, McGregor, Texas.
McIntosh and Lauderdale, Calvert, Texas.
McKay and Meyer, Navasota, Texas.
McKee, J. F. and R. D., Eldorado, Texas.
McKinney Cotton Oil Mill Company, McKinney, Texas.

McKnight, Robert L., Barstow, Texas.
McLain, J. P., Mickey, Texas.
McLain Gin Company, Dawson, Texas.
McLeroy Milling Company, Normangee, Texas.
McNabb, E. L., Nacona, Texas.
McQuatters, J. J. and Son, Waxahachie, Texas.
McWilliams, J. W., and Company, Van Alstyne, Texas.
Madill Grain and Elevator Company, Madill, Oklahoma.
Madisonville Oil Mill and Fertilizer Company, Madisonville, Texas.
Magnolia Cotton Oil Company, Houston, Texas.
Majestic Milling Company, Arora, Missouri.
Mangum Mill and Elevator Company, Mangum, Oklahoma.
Mansfield Cotton Oil Company, Mansfield, Texas.
Marco Mills, Pine Bluff, Arkansas.
Mark, J. B., Hastings, Oklahoma.
Marks Grain Company, Austin, Texas.
Marlin Oil Company, Marlin, Texas.
Marsh Milling and Grain Company, Madill, Oklahoma.
Marshall, W. D., Company, Lake Charles, Louisiana.
Marshall Brothers, Watongo, Oklahoma.
Marshall Cereal Company, Marshall, Oklahoma.
Marshall Cotton Oil Company, Marshall, Texas.
Marshall Grain Company, Floydada, Texas.
Marshall Mill and Elevator Company, Marshall, Texas.
Mart Cotton Oil Company, Mart, Texas.
Martha Alfalfa Milling Company, Martha, Oklahoma.
Martin, C., Gorman, Texas.
Martin, C. J., Austin, Texas.
Martinez, B., and Son, San Antonio, Texas.
Maruchau, M., Grain Company, San Antonio, Texas.
Marvel Mill Company, Hillsboro, Texas.
Mason Brothers, San Angelo, Texas.
Mason Grain Company, Brownsville, Texas.
Mason Ice and Power Company, Mason, Texas.
Mathews, G. W., Grain and Elevator Company, Terrell, Texas.
Mathis and Davis, Goliad, Texas.
Meader Atlas Company, New York, New York.
Mealer, T. H., Garland, Texas.
Meeks, R. E., Gatesville, Texas.
Memphis Cotton Hull and Fiber Company, Memphis, Tennessee.
Memphis Cotton Oil Company, Memphis, Texas.
Memphis Milling Company, Memphis, Texas.
Menefee, J., Alvin, Texas.
Merchants and Planters Oil Company, Houston, Texas.
Meridian Mill Company, Meridian, Texas.
Mesquite Corn Mill, Mesquite, Texas.
Meyer, John F., and Sons Milling Company, Springfield, Missouri.
Meyer and Bailey, Rosenberg, Texas.
Mischot, J. A., and Son, Port Lavaca, Texas.

Midgit Marvel Mill, Brownwood, Texas.
Midland Mercantile Company, Midland, Texas.
Midlothian Oil and Gin Company, Midlothian, Texas.
Miller, Carl, Runge, Texas.
Miller, C. E., Anthony, New Mexico.
Miller Brothers, Bliss, Oklahoma.
Miller and Company, Wagoner, Oklahoma.
Miller, Wills and Cox, Mexia, Texas.
Mills Brothers, Hubbard City, Texas.
Miltendugar, Wilbur, Clinton, Oklahoma.
Minco Mill and Grain Company, Minco, Oklahoma.
Mineola Cotton Oil Company, Mineola, Texas.
Mineral Wells Cottonseed Oil Company, Mineral Wells, Texas.
Mineral Wells Roller Mills Company, Mineral Wells, Texas.
Missouri and Kansas Grain Company, Neosho, Missouri.
Mitchell and Sledge, Frisco, Texas.
Mitchel Grain Company, Pauls Valley, Oklahoma.
Mitchum, J. M., Park Springs, Texas.
Model Milling Company, Greeley, Colorado.
Model Milling Company, Guthrie, Oklahoma.
Moers Seed Company, Houston, Texas.
Moffit, E. A., Mineral Wells, Texas.
Moliner, J. Y. Rey, El Paso, Texas.
Monarch Milling Company, Hutchinson, Kansas.
Montemayor, Carlos, Ruedosia, Texas.
Montemeyar, Enrique, Presidio, Texas.
Moody Grain and Elevator Company, Moody, Texas.
Moore and Williams, Burkburnett, Texas.
Moore Grain Company, Chickasha, Oklahoma.
Moore, G. W., Miles, Texas.
Moran Milling Company, Lamar, Missouri.
Moreland and Stephenson, Fluvanna, Texas.
Morgan, C. R., Bowie, Texas.
Morgan, P. A., Gatesville, Texas.
Morgan, Mastonn Company, Grandview, Texas.
Morris, C. F., DeLeon, Texas.
Morris, T. J., Carbon, Texas.
Morrison Brothers Mill, Jefferson, Oklahoma.
Morris Gin and Machinery Company, Palestine, Texas.
Morten Milling Company, Dallas, Texas.
Moulton Oil and Gin Company, Moulton, Texas.
Mound Ridge Milling Company, Mound Ridge, Kansas.
Mount Calm Cotton Oil Company, Mount Calm, Texas.
Mount Pleasant Oil Mill, Mount Pleasant, Texas.
Moutray, J. G., Elevator Company, El Campo, Texas.
Mugge, J. E., and Company, San Antonio, Texas.
Munday Cotton Oil Company, Munday, Texas.
Munday Supply and Feed House, Munday, Texas.
Munger Oil and Cotton Company, Mexia, Texas.

Munn Corn Products Company, Little Rock, Arkansas.
Mutual Cotton Oil Company, Fort Worth, Texas.
Myra Mill and Elevator Company, Myra, Texas.

Nacogdoches Oil Mill, Nacogdoches, Texas.
Nail, R. E., Albany, Texas.
Nash-Robinson and Company, Marlin, Texas.
National Feed Company, St. Louis, Missouri.
Navarro Cotton Oil Company, Corsicana, Texas.
Nebraska Corn Mills, Lincoln, Nebraska.
Nebraska Corn Products Company, Beatrice, Nebraska.
Neilson, Taylor Company, Shreveport, Louisiana.
Nelson Grain Company, Kansas City, Missouri.
Nelson, J. W., and Company, Little Elm, Texas.
Nelson, I. A. J., Reagan Wells, Texas.
Nelson and Smalley, Claude, Texas.
Newcastle Mill and Elevator Company, Newcastle, Texas.
Newman, J. F., Oil Mill Company, Sweetwater, Texas.
Newton, W. R., Hillsboro, Texas.
Newton and Harris, McLean, Texas.
Newton Milling and Elevator Company, Newton, Kansas.
New Ulm Cotton Oil Mill, New Ulm, Texas.
Nicholson, Robert, Dallas, Texas.
Niggli, F. F., Eagle Pass, Texas.
Ninnekah Elevator Company, Ninnekah, Oklahoma.
Nixon Grain Company, Nixon, Texas.
Nuenschwander, F. W., Pflugerville, Texas.
Noack, O. G., Navasota, Texas.
Nocona Mill and Gin Company, Nocona, Texas.
Norman Milling and Grain Company, Norman, Oklahoma.
Normangee Milling Company, Normangee, Texas.
Northwest Mills Company, Winona, Minnesota.
Northern Illinois Cereal Company, Lockport, Illinois.
Norton, Willis and Company, North Topeka, Kansas.
Norwood, J. M., Hempstead, Texas.
Nutriline Milling Company, Crowley, Louisiana.

Oak Cliff Milling Company, Dallas, Texas.
O'Connor, F. J., Gonzales, Texas.
Ochiltree Roller Mills, Ochiltree, Texas.
Odom Milling Company, Odom, Texas.
Offer, Aug., Waring, Texas.
Oglesby Roller Mills, Oglesby, Texas.
Okeepe, T. P., Karnes City, Texas.
Okeene Roller Mills, Okeene, Oklahoma.
O. K. Mill and Grain Company, Estelline, Texas.
Oklahoma City Mill and Elevator Company, Oklahoma City, Oklahoma.
Oklahoma Cotton Oil Company, Oklahoma City, Oklahoma.
Oklahoma Mill Company, Kingfisher, Oklahoma.
Okmulgee Mill and Elevator Company, Okmulgee, Oklahoma.

Omaha Alfalfa Milling Company, Omaha, Nebraska.
Omaha Cotton Oil Company, Omaha, Texas.
Oquinn, J. E., Lamesa, Texas.
Orange Rice Mill Company, Orange, Texas.
Orient Milling Company, Chillicothe, Texas.
Orth Milling Company, Yoakum, Texas.
Orton, S. B., Canyon, Texas.
Osborne and Jones, McAllen, Texas.
Oswego Milling Company, Oswego, Kansas.
Ozark Feed Company, Neosho, Missouri.
Ozark Water Mill, Ozark, Missouri.

Paducah Milling Company, Paducah, Texas.
Page, Thomas, Topeka, Kansas.
Paine, C. C., Rockport, Texas.
Palestine Grain Company, Palestine, Texas.
Palm, J. E., Round Rock, Texas.
Pampa Grain Company, Pampa, Texas.
Panhandle Grain and Elevator Company, Amarillo, Texas.
Panhandle Mill Company, Dalhart, Texas.
Pankratz Milling Company, Norwich, Kansas.
Panola Cotton Oil Company, Carthage, Texas.
Panther City Grain Company, Fort Worth, Texas.
Pargmann, Dietrich, Runge, Texas.
Paris Fuel Company, Paris, Texas.
Paris Milling Company, Paris, Texas.
Park, J. P., Hulver, Texas.
Park Mill and Elevator Company, Iowa Park, Texas.
Parker, J. E., Milford, Texas.
Parker, J. I., Fluvanna, Texas.
Parker, Mrs. E. and Son, Normangee, Texas.
Parmer, A. H., Eldorado, Texas.
Patterson Milling Company, Monett, Missouri.
Patteson, G. E. and Company, Memphis, Tennessee.
Patton-Rardin Grain Company, Texhoma, Oklahoma.
Pauls Valley Milling Company, Pauls Valley, Oklahoma.
Pearl Roller Mills, Oswego, Kansas.
Pease Moore Milling Company, West Plains, Missouri.
Pecan Gap Cotton Oil Company, Pecan Gap, Texas.
Pecos Alfalfa Milling Company, Pecos, Texas.
Pecos Mercantile Company, Pecos, Texas.
Pecos Valley Alfalfa Mill Company, Hagerman, New Mexico.
Pennington Brothers, Royse City, Texas.
Peoples Cotton Oil Company, Sulphur Springs, Texas.
Peoples Oil and Cotton Company, Wharton, Texas.
Perrin Milling Company, Perrin, Texas.
Perry, F. S., Gorman, Texas.
Perry and Allen, Glen Cove, Texas.
Perry Mill Company, Perry, Oklahoma.

Peters, E. T., Bandera, Texas.
Peters, M. C., Mill Company, Omaha, Nebraska.
Peterson and Pietsch, Calvert, Texas.
Petroliia Grain Company, Petroliia, Texas.
Petty, Clarence, Noble, Oklahoma.
Pflugerville Cotton Seed Oil Company, Pflugerville, Texas.
Pharr Mill and Elevator Company, Pharr, Texas.
Phillips Milling Company, Belton, Texas.
Pietzsch, L., and Son, East Bernard, Texas.
Pilot Point Cotton Oil Mill Company, Pilot Point, Texas.
Pilot Point Roller Mills Company, Pilot Point, Texas.
Pioneer Flour Mills, San Antonio, Texas.
Pioneer Mill and Elevator Company, Albany, Texas.
Pipkin, S. M., Pampa, Texas.
Pitman, E. E., Marlin, Texas.
Pitts, D. D., Grandview, Texas.
Pittsburg Cotton Oil Company, Pittsburg, Texas.
Pittman, M. M., Roller Mills, Cleburne, Texas.
Pittman and Harrison Company, Sherman, Texas.
Plains Lumber and Grain Company, Happy, Texas.
Plano Cotton Oil Company, Plano, Texas.
Plano Ice Company, Plano, Texas.
Plant, George P., Milling Company, St. Louis, Missouri.
Planters Cotton Oil Company, Bonham, Texas.
Planters Cotton Oil Company, Dallas, Texas.
Planters Cotton Oil Company, Frost, Texas.
Planters Cotton Oil Company, Navasota, Texas.
Planters Cotton Oil Company, Nocona, Texas.
Planters Cotton Oil Company, Waxahachie, Texas.
Planters Gin Company, Frost Texas.
Planters Oil Company, Hearne, Texas.
Planters Oil Company, Taylor, Texas.
Planters Oil Company, Weatherford, Texas.
Platt, W. H., Petersburg, Texas.
Poe, Oscar, Eagle Pass, Texas.
Poff, Cecil, El Paso, Texas.
Polk Brothers, Harrisonville, Missouri.
Ponca City Milling, Company, Ponca City, Oklahoma.
Port Arthur Export Company, Port Arthur, Texas.
Port Arthur Rice Milling Company, Port Arthur, Texas.
Porter, W. A., and Son, Tulia, Texas.
Porter Mill and Elevator Company, Porter, Oklahoma.
Powell Oil Mill, Bastrop, Texas.
Powell, W. J., and Son, Beeville, Texas.
Powitzky, E. H., Guadalupe, Texas.
Prewit and Wadley, Pecos, Texas.
Price, P. V., Mount Blanco, Texas.
Price, Tom, Leaky, Texas.
Prine, M. M., Bardwell, Texas.

Pritchard, J. T., and Son, Batura, Texas.
Pritchard Rice Milling Company, Houston, Texas.
Proctor and Allen, Groesbeck, Texas.
Prosper Mill, Prosper, Texas.
Pundt, Henry, Panhandle, Texas.
Purcell Mill and Elevator Company, Purcell, Oklahoma.
Purity Milling Company, Manhattan, Kansas.
Purity Oats Company, Davenport, Iowa.

Quaker Oats Company, Chicago, Illinois.
Quality Mills, Austin, Texas.
Quanah Cotton Oil Company, Quanah, Texas.
Quanah Mill and Elevator Company, Quanah, Texas.

Rainey, B. F., Water Valley, Texas.
Raiza Milling Company, Lewisville, Texas.
Raiza and Sons, Bluffdale, Texas.
Ralston Purina Company, St. Louis, Missouri.
Ramsel, F., El Dorado, Texas.
Ramsey, T. M., Abilene, Texas.
Randel, L. T., Chillicothe, Texas.
Randol, R. A., Arlington, Texas.
Ransom, Real F., Richmond, Texas.
Rapier Sugar Feed Company, Owensboro, Kentucky.
Raubinger, William, Everton, Missouri.
Ray, Carl, Milling Company, Shamrock, Texas.
Rayne Rice Milling Company, Rayne, Louisiana.
Rea and Page Milling Company, Marshall, Missouri.
Rea-Patterson Milling Company, Coffeyville, Kansas.
Rea-Reed Mill and Elevator Company, Tulsa, Oklahoma.
Red, R. B., Lou, Texas.
Redman, Christian, Ganado, Texas.
Reeds Milling Company, Reeds, Missouri.
Red Star Mill and Elevator Company, Wichita, Kansas
Regina Flour Mill Company, St. Louis, Missouri.
Reichert Milling Company, Freeburg, Illinois.
Reinemer and Penick, Sabinal, Texas.
Reinhard, Charles, Boerne, Texas.
Reinhardt, W. C., Granger, Texas.
Reliance Roller Mill, Fredericksburg, Texas.
Renshaw, W. S. W., Bridgeport, Texas.
Rentz, J. A., Weatherford, Texas.
Rhome Milling Company, Rhome, Texas.
Rickert's Rice Mills, New Orleans, Louisiana.
Riddle, W. E., Austin, Texas.
Riemenschneider, C. F., Sarco Creek, Texas.
Rio Grande Grain and Milling Company, Merced, Texas.
Riverside Cotton Oil Company, Fort Worth, Texas.
Riverside Farm, San Marcos, Texas.
Roach, W. A., Dodsonville, Texas.

Roberts, L. L., Waller, Texas.
 Robertson, L., Round Rock, Texas.
 Robbins, J. I., Coolidge, Texas.
 Robinett-Buchanan Milling Company, Whitesboro, Texas.
 Robinson Brothers, Austin, Texas.
 Robinson, C. W., and Company, Houston, Texas.
 Robinson, H. B., Quinlan, Texas.
 Robinson-Danforth Company, St. Louis, Missouri.
 Rockdale Oil Company, Rockdale, Texas.
 Rockwall Cotton Oil Company, Rockwall, Texas.
 Rockwall Grain and Elevator Company, Rockwall, Texas.
 Rockwall Light, Ice and Gin Company, Rockwall, Texas.
 Roddie, H. P., Commission Company, Menard, Texas.
 Rodgers, P. M., Bertram, Texas.
 Roff Grain Company, Roff, Oklahoma.
 Rogers, Charlie, Arlington, Texas.
 Rogers, J. E., Houston, Texas.
 Rogers Milling Company, Coleman, Texas.
 Rogers Milling Company, Rogers, Arkansas.
 Rogers Produce Company, Rogers, Texas.
 Rogers, R. B., Wheeler, Texas.
 Rollow, John A., Wynnewood, Oklahoma.
 Roquemore, G. P., Coleman, Texas.
 Rosebud Oil and Cotton Company, Rosebud, Texas.
 Rosenberg Mill and Elevator Company, Rosenberg, Texas.
 Roswell Wool and Hides Company, Roswell, New Mexico.
 Rowan Mills, Sherman, Texas.
 Roxton Cotton Oil Company, Roxton, Texas.
 Royse Cotton Oil Company, Royse City, Texas.
 Rudy-Patrick Seed Company, Kansas City, Missouri.
 Rule Cotton Oil Company, Rule, Texas.
 Runge, H., and Company, Cuero, Texas.
 Runkle and Peacock, El Paso, Texas.
 Russell, Hardee, Winsboro, Texas.
 Russell-Coleman Cotton Oil Company, San Antonio, Texas.
 Ryan Cotton Oil Company, Ryan, Oklahoma.
 Ryan Mill and Elevator Company, Ryan, Oklahoma.
 Rylander and Cheatham, Lockhart, Texas.

 St. Clair, J. D., Sherwood, Texas.
 St. John Mill, St. John, Kansas.
 St. John Mill and Power Company, St. John, Kansas.
 St. Joseph Hay and Feed Company, St. Joseph, Missouri.
 St. Marys Mill Company, St. Marys, Missouri.
 Sackenreuther, P. G., Houston, Texas.
 Sames, Moore and Company, Laredo, Texas.
 Santa Ana Co-operative Sugar Company, Santa Ana, California.
 San Angelo Cotton Oil Company, San Angelo, Texas.
 San Antonio Brewing Association, San Antonio, Texas.
 San Antonio Grain Company, San Antonio, Texas.

- San Antonio Mill and Elevator Company, San Antonio, Texas.
San Antonio Oil Works, San Antonio, Texas.
San Augustine Cotton Oil Company, San Augustine, Texas.
San Benito Commission Company, San Benito, Texas.
Sanders Brothers Company, Texarkana, Texas.
San Elizario Roller Mills, San Elizario, Texas.
Sanger Mill and Elevator Company, Sanger, Texas.
San Marcos Milling Company, San Marcos, Texas.
San Marcos Oil and Gin Company, San Marcos, Texas.
San Saba Cotton Oil and Gin Company, San Saba, Texas.
San Saba Milling Company, San Saba, Texas.
Sansom and Company, Fort Worth, Texas.
Santa Fe Fuel Company, El Paso, Texas.
Sarcoxie Electric Light and Milling Company, Sarcoxie, Missouri.
Satax Seed Company, San Antonio, Texas.
Satterwhite, B. L., Crockett, Texas.
Sauer, N., Milling Company, Cherryville, Kansas.
Sawyer, M. B., Brownfield, Texas.
Saxony Mills, St. Louis, Missouri.
Scheef Brothers Grain Company, Marlin, Texas.
Schlinke, J. W., Kingsville, Texas.
Schoening-Koenigsmark Milling Company, Prairie Du Rocher, Illinois.
Schuhart Grain Company, Dalhart, Texas.
Schulenburg Oil Mill, Schulenburg, Texas.
Schulz Gin and Milling Company, Falls City, Texas.
Schulze, F. W., Bangs, Texas.
Schumaker Oil Works, Navasota, Texas.
Schuster Commission Company, El Paso, Texas.
Scott County Milling Company, Sikeston, Missouri.
Scott and Lambert, Colorado, Texas.
Scott, John R., Childress, Texas.
Scott and McKowan Gin and Milling Company, Sherman, Texas.
Seaboard Rice Milling Company, Galveston, Texas.
Sealy Grist Mills, Sealy, Texas.
Sealy Oil Mill and Manufacturing Company, Sealy, Texas.
Sears Roebuck and Company, Dallas, Texas.
Seay, G. W., Miami, Texas.
Security Flour Mills, Abilene, Kansas.
Seggerman, H., El Paso, Texas.
Seguin Milling and Power Company, Seguin, Texas.
Seidel, William, Brenham, Texas.
Seley-Early Grain Company, Waco, Texas.
- Seemple, O. Y., Oklahoma City, Oklahoma.
Seneca Mill and Elevator Company, Seneca, Missouri.
Setz, D., Houston, Texas.
Setzler, W. R., Milling Company, Wolfe City, Texas.
Sewell Grain and Fuel Company, Vernon, Texas.
Seymour Cotton Oil Company, Seymour, Texas.

Seymour Mill, Elevator and Light Company, Seymour, Texas.
Shaffer Feed and Produce Company, Hico, Texas.
Shamrock Mill and Elevator Company, Shamrock, Texas.
Shannon Brothers, Cuero, Texas.
Shattuck Clearing House Company, Higgins, Texas.
Shaw, T. J., Jersey Farm, Ginger, Texas.
Shawnee Milling Company, Shawnee, Oklahoma.
Sheffield and McSpadden, Teague, Texas.
Shellabarger Mill and Elevator Company, Salina, Kansas.
Sheperd, A. C., Gomez, Texas.
Sherman Oil Mill, Sherman, Texas.
Sherrill Elevator Company, Haskell, Texas.
Shindler, W. H., Hempstead, Texas.
Shiner Oil Mill and Manufacturing Company, Shiner, Texas.
Shive and Keys Mill and Elevator Company, Waxahachie, Texas.
Shotwell, S. A., and Company, Canyon, Texas.
Shreveport Mill and Elevator Company, Shreveport, Louisiana.
Sikes, T. J., Killeen, Texas.
Simms, M. M., Sinton, Texas.
Simms Brothers, New Boston, Texas.
Simons, George F., Edna, Texas.
Siratt and Edwards, Grand View, Texas.
Sledge, C. B., Navasota, Texas.
Sleeper Milling and Grain Company, Valley Mills, Texas.
Smith, A. F., Sunset, Texas.
Smith, A. H., Martindale, Texas.
Smith, Ed., Ingram, Texas.
Smith Brothers, Waco, Texas.
Smith, Cicero, Lumber Company, Fort Worth, Texas.
Smith Brothers Grain Company, Fort Worth, Texas.
Smith, G. B. R., Milling Company, Sherman, Texas.
Smith, J. C., Grain Company, Waco, Texas.
Smith, M. H., Alex, Oklahoma.
Smith, W. V., Stoneburg, Texas.
Smithville Oil Mill Company, Smithville, Texas.
Smyers, L. C., Byers, Texas.
Snell Mill and Grain Company, Clay Center, Kansas.
South, L. A., Proctor, Texas.
Southern Cotton Oil Company, Memphis, Tennessee.
South Texas Cotton Oil Company, Houston, Texas.
South Texas Grain Company, Houston, Texas.
Southern Grain Company, Kansas City, Missouri.
Southern Rice Growers Association, Houston, Texas.
Southland Cotton Oil Company, Corsicana, Texas.
Southland Cotton Oil Company, Paris, Texas.
Southland Cotton Oil Company, Temple, Texas.
Southland Cotton Oil Company, Waxahachie, Texas.
Southwestern Milling Company, Kansas City, Missouri.
Sowell, D. S., Cleburne, Texas.

Sparkman, R. S., Crisp, Texas.
Sparks Brothers, Alton, Illinois.
Spence, J. N., May, Texas.
Springfield Whole Sale Flour and Feed Company, Springfield, Missouri.
Springstun, C. E., Van Court, Texas.
Spur Grain and Coal Company, Spur, Texas.
Spur Milling and Grain Company, Spur, Texas.
Spur Oil Mill Company, Spur, Texas.
Stamford Mill and Elevator Company, Stamford, Texas.
Stamford Oil Mill Company, Stamford, Texas.
Stanard-Tilton Milling Company, Dallas, Texas.
Stanard-Tilton, Milling Company, St. Louis, Missouri.
Standard Milling Company, Houston, Texas.
Standard Milling Company, Oklahoma City, Oklahoma.
Standles, U. S., Kenedy, Texas.
Stanush Brothers, Lemings, Texas.
Star Grocery Company, Rockdale, Texas.
Star Mill and Elevator Company, Hennessey, Oklahoma.
Star Milling Company, Mountain Grove, Missouri.
Star Roller Mills, Wharton, Texas.
Stark Grain Company, Plano, Texas.
Steele, O. L., Navasota, Texas.
Steger Grain Company, Dallas, Texas.
Steger Milling Company, Bonham, Texas.
Steger Milling Company, Denison, Texas.
Steinberg-Maas Company, Houston, Texas.
Steinhagen-Houk Rice Milling Company, Beaumont, Texas.
Steinle and Steinle, Jourdanton, Texas.
Stephen County Elevator Company, Duncan, Oklahoma.
Sterrett, D. K., Ryan, Oklahoma.
Stevens, C. P., Merkel, Texas.
Stevens Scott Grain Company, Wichita, Kansas.
Stewart and Russell, Morris, Oklahoma.
Stiles, S. E., Cleburne, Texas.
Stillwater Mill and Elevator Company, Stillwater, Oklahoma.
Stillwell, John H., Canadian, Texas.
Stockdale Cottonseed Oil Company, Stockdale, Texas.
Stock Yard Cotton and Linseed Meal Company, Kansas City, Missouri.
Stolz and Peterson, Galveston, Texas.
Stone, R. C., Milling Company, Springfield, Missouri.
Stout, W. M., and Son, Estelline, Texas.
Stratton, J. E., Lucas, Texas.
Strawn Flour Milling Company, Strawn, Texas.
Streetman Corn Mill, Streetman, Texas.
Strickland, A. B., Vos, Texas.
Strieber Brothers, Yorktown, Texas.
Strong, B., Grain and Coal Company, Conway Springs, Kansas.
Strubbs Brothers, Grand Prairie, Texas.
Stuttgart Rice Mill Company, Stuttgart, Arkansas.

Sugarland Manufacturing Company, Sugarland, Texas.
Suizberger and Sons Company, Chicago, Illinois.
Summers, Alva, Mesquite, Texas.
Sunset Grain Company, Sansom, Texas.
Sunset Milling Company, Temple, Texas.
Superior Corn Mills, Superior, Nebraska.
Superior Mills, Wharton, Texas.
Sweet Springs Milling Company, Sweet Springs, Missouri.
Swift and Company, Fort Worth, Texas.
Swink, B. L., Richland, Texas.
Sylvia Mill and Elevator Company, Sylvia, Kansas.

T & B Mill Company, Jet, Oklahoma.
Taft Oil and Gin Company, Taft, Texas.
Tahoka Mill and Elevator Company, Tahoka, Texas.
Tamilina Milling Company, San Antonio, Texas.
Tampa Milling Company, Tampa, Kansas.
Tarkio Molasses Feed Company, Kansas City, Missouri.
Taylor Cotton Oil Company, Taylor, Texas.
Taylor Cotton Oil Works, Taylor, Texas.
Taylor Grain Company, San Augustine, Texas.
Taylor Grain and Elevator Company, Corpus Christi, Texas.
Taylor-Haigler Grain Company, Hearne, Texas.
Taylor Milling Company, Taylor, Texas.
Tecumseh Oil and Cotton Company, Tecumseh, Oklahoma.
Temple Cotton Oil Mill, Temple, Texas.
Templeton, F., Munday, Texas.
Tennessee Fiber Company, Memphis, Tennessee.
Terminal Grain Company, Fort Worth, Texas.
Terrell Cotton Oil Company, Terrell, Texas.
Terrell Milling Company, Terrell, Texas.
Terry, W. B., Marlow, Oklahoma.
Terry, C. R., Corsicana, Texas.
Terry County Mill and Feed Company, Brownfield, Texas.
Texarkana Cotton Oil and Fertilizer Company, Texarkana, Arkansas.
Texas Cake and Linter Company, Dallas, Texas.
Texas City Grain and Fuel Company, Texas City, Texas.
Texas Cooking Oil Company, Burlington, Texas.
Texas Cottonseed Crushers' Association, Galveston, Texas.
Tex-Mex Milling Company, San Antonio, Texas.
Texas-Mexican Milling Company, Laredo, Texas.
Texas Refining Company, Greenville, Texas.
Texas Rice Mills, Houston, Texas.
Texas Seed Breeding Farm, Sherman, Texas.
Texas Seed and Floral Company, Dallas, Texas.
Texas Star Flour Mills, Galveston, Texas.
Texhoma Mill and Elevator Company, Texhoma, Oklahoma.
Thomas, G. W., Ninnekah, Oklahoma.
Thomas, J. B., Wellington, Texas.
Thomas Milling Company, Thomas, Oklahoma.

Thompson, W. E., Franklin, Texas.
Thorndale Oil Mill Company, Thorndale, Texas.
Thornton, L. B., Commerce, Texas.
Throckmorton Milling Company, Throckmorton, Texas.
Tims, S., Belton, Texas.
Tolar Grist Mill, Toler, Texas.
Tom Bean Grain Company, Tom Bean, Texas.
Tonkawa Mill and Elevator Company, Tonkawa, Oklahoma.
Townsend Grain Company, Tulia, Texas.
Toya Valley Alfalfa Milling Company, Balmorhea, Texas.
Trautham, T. J., Texline, Texas.
Trinity Commission Company, Trinity, Texas.
Trinity Cotton Oil Company, Dallas, Texas.
Tucker and Seward, Liberty Hill, Texas.
Turner, Wiley, Abilene, Texas.
Turon Mill and Elevator Company, Turon, Kansas.
Twin Falls Mill and Elevator Company, Twin Falls, Idaho.
Tyler Cotton Oil Company, Tyler, Texas.
Tyrrell Rice Milling Company, Beaumont, Texas.

Union Gin and Oil Company, Eliasville, Texas.
Union Supply House, Lone Oak, Texas.
United States Stock Food Company, Kansas City, Missouri.
United Oil Mill, Ashdown, Arkansas.
Uvalde Milling Company, Uvalde, Texas.

Valley Center Alfalfa Milling Company, Valley Center, Kansas.
Valley Mills Cotton Oil Company, Valley Mills, Texas.
Van Alstyne Cotton Oil Company, Van Alstyne, Texas.
Van Alstyne Roller Mills, Van Alstyne, Texas.
Vance, J. W., Pierce City, Missouri.
Vardy Brothers, Estelline, Texas.
Venable and Whittington, Bardwell, Texas.
Verden Milling Company, Verden, Oklahoma.
Vernon Cotton Oil Company, Vernon, Texas.
Vick Brothers, Bryan, Texas.
Victoria Milling Company, Victoria, Texas.
Victoria Manufacturing Company, Victoria, Texas.
Villegas, L., Laredo, Texas.
Vincent Brothers, Tom Bean, Texas.
Vodder, Robert, Blum, Texas.

Waco Cotton Oil Mill Company, Waco, Texas.
Waco Mill and Elevator Company, Waco, Texas.
Wade, John, and Son, Memphis, Tennessee.
Waerden Brothers, Glen Flora, Texas.
Waggoner Gates Mill Company, Independence, Missouri.
Waggoner Grain Company, San Antonio, Texas.
Walberg-Johnson Grain Company, Pampa, Texas.
Walker and Brice, Fleetwood, Oklahoma.

Walker Grain Company, Fort Worth, Texas.
Wall-Rogalsky Milling Company, McPherson, Kansas.
Wallace, W. H., Mexia, Texas.
Walnut Creek Milling Company, Great Bend, Kansas.
Wamba Gin Company, Wamba, Texas.
Warrick, J. E., Wellington, Texas.
Washburn Crosby Company, Minneapolis, Minnesota.
Washer, S. R., Grain Company, Atchinson, Kansas.
Waterloo Milling Company, Waterloo, Illinois.
Watson, H. H., Longview, Texas.
Watson, J. N., Lamesa, Texas.
Weather Grain Company, Greenville, Texas.
Weatherford Milling Company, Weatherford, Oklahoma.
Weaver, Isaac, El Campo, Texas.
Webster, Meal L., Company, Waco, Texas.
Wehmeyer, Henry, Washington, Texas.
Weid, E. H., Nordheim, Texas.
Weimar Oil Works, Weimar, Texas.
Weir, Peter, Karnes City, Texas.
Weiss Otto, Alfalfa Stock Food Company, Wichita, Kansas.
Welch, W. C., Vera, Texas.
Wellington Milling Company, Wellington, Missouri.
Wellington Milling Company, Wellington, Texas.
Wellington Milling and Elevator Company, Wellington, Kansas.
Wells-Abbot-Neuman, Schuyler, Nebraska.
West Cotton Oil Mill, West, Texas.
West End Corn Mill, Denison, Texas.
West Texas Fuel Company, El Paso, Texas.
Westbrook Grain and Commission Company, Pine Bluff, Arkansas.
Western Cotton Oil Company, San Antonio, Texas.
Western Cotton Oil and Gin Company, Haskell, Texas.
Western Grain Company, Kansas City, Missouri.
Western Grocery Company, El Paso, Texas.
Whaley Mill and Elevator Company, Gainesville, Texas.
Wharton County Warehouse Company, El Campo, Texas.
Wharton Milling Company, Wharton, Texas.
Wheeler County Cotton Oil Company, Shamrock, Texas.
White Eagle Milling Company, Eagle Lake, Texas.
White, J. E., Clint, Texas.
White Gin Company, Tyler, Texas.
Whitesboro Cotton Oil Company, Whitesboro, Texas.
Whitesides, H. E., Rochester, Texas.
Whitewright Cotton Oil Company, Whitewright, Texas.
Whitewright Mill and Elevator Company, Whitewright, Texas.
Wichita Cotton Oil Company, Wichita Falls, Texas.
Wichita Flour Mills Company, Wichita, Kansas.
Wichita Mill and Elevator Company, Wichita Falls, Texas.
Wieser, J. F., and Company, Hico, Texas.
Wiggins, John, Happy, Texas.

Wigam and Brooks, Burkburnett, Texas.
Wight and Anthony, Midland, Texas.
Wilborn and Brown Milling Company, Nursery, Texas.
Willett Milling Company, Ginsite, Texas.
Willett Milling Company, Paducah, Texas.
Williams, S. C., Cotton Oil Company, Bruceville, Texas.
Williams, John R., Post City, Texas.
Williamson Milling Company, Clay Center, Kansas.
Willig Brothers Flouring Mills, Temple, Texas.
Wills Point Cotton Oil Company, Wills Point, Texas.
Willson, William, P. M., Cisco, Texas.
Wilson-Legler Hay and Grain Company, Leavenworth, Kansas.
Winfield Alfalfa Milling Company, Winfield, Kansas.
Winney, John, Wellington, Texas.
Winnsboro Cotton Oil Company, Winnsboro, Texas.
Winters Cotton Oil Company, Winters, Texas.
Winters Light and Milling Company, Winters, Texas.
Wise, W. D., Seed Company, El Paso, Texas.
Wisrodt Grain Company, Galveston, Texas.
Wisrodt Grain Company, Rosenberg, Texas.
Wolf Milling Company, Ellinwood, Kansas.
Wolf Milling Company, New Haven, Missouri.
Wolfe City Milling Company, Wolfe City, Texas.
Wood and Plaster, Headley, Texas.
Wooldridge, J. C., Gainesville, Texas.
Wormser Brothers, Laredo, Texas.
Worth Milling Company, Fort Worth, Texas.
Wortham Cotton Oil Company, Wortham, Texas.
Wright, M. W., and Company, Bardwell, Texas.
Wyman, L. H., Quanah, Texas.

Yarborough, Guy, Navasota, Texas.
Yoakum Cotton Oil Company, Yoakum, Texas.
Yorktown Cotton Oil and Manufacturing Company, Yorktown, Texas.
Young, E. H., Galveston, Texas.
Young and Bennett, San Angelo, Texas.
Young and Moore, Georgetown, Texas.
Yukon Mill and Grain Company, Yukon, Oklahoma.

Zedler, B., Ottine, Texas.
Zedler, H. C., and Company, Luling, Texas.
Zeiset, John, Harold, Texas.
Zeiss Brothers, Brenham, Texas.

AVERAGE COMPOSITION OF CONCENTRATED COMMERCIAL FEEDING STUFFS.

Table I shows the average chemical composition of the concentrated commercial feeding stuffs, the analyses of which are printed in this bulletin. The chemical composition of the mixed feeds is not included in this table.

TABLE I.

Average Contents of Protein, Fat, Crude Fiber, Nitrogen-Free Extract, Water and Ash in Feed Control Samples.

	Name of Feedstuff.	Protein.	Crude Fat.	Crude Fiber.	Nitrogen-Free Extract.	Water.	Ash.
2	Alfalfa Meal.....	15.16	1.80	31.24	34.91	8.44	8.45
2	Barley Chops.....	11.68	1.90	6.96	65.86	10.48	3.12
140	Corn Chops.....	10.07	4.18	2.43	70.70	11.26	1.36
8	Corn Bran.....	9.34	5.14	10.41	62.41	10.63	2.07
5	Corn Feed Meal.....	10.77	4.80	3.09	68.46	11.11	1.77
117	*Cottonseed Cake.....	*42.99	6.81	*11.12	25.69	7.92	5.47
249	*Cottonseed Meal.....	*43.54	7.80	10.52	25.23	7.34	5.57
28	Cold Pressed Cottonseed.....	25.99	7.97	23.39	29.62	8.83	4.20
1	Dried Beet Pulp.....	9.44	.76	19.60	58.82	8.74	2.64
6	Dried Brewers' Grain.....	22.49	6.32	14.53	45.26	7.40	4.00
6	Feterita Chops.....	12.15	2.75	2.00	70.45	11.24	1.41
3	Feterita Head Chops.....	9.50	2.54	9.31	66.16	8.69	3.80
1	Fish Meal.....	69.52	4.94	.56	.86	7.10	17.02
2	Ground Oats.....	12.08	4.40	12.33	57.88	9.44	3.87
3	Hominy Feed.....	10.29	6.17	6.88	64.05	10.56	2.05
1	Kafir Head Chops.....	8.99	2.48	6.30	69.31	10.09	2.83
1	Kafir Meal.....	13.35	3.50	2.19	68.45	10.86	1.65
19	Kafir Chops.....	11.15	3.07	2.32	70.82	11.05	1.59
112	Milo Chops.....	11.01	2.83	2.32	71.11	11.05	1.68
22	Milo Head Chops.....	9.82	2.52	6.59	67.66	10.29	3.12
2	Milo Meal.....	9.86	3.61	2.51	69.31	12.29	2.42
1	Meat Scrap.....	59.70	11.20	3.94	.21	6.47	18.48
1	Peanut Cake.....	45.38	8.23	8.05	24.96	6.01	7.37
1	Peanut Meal.....	42.00	9.57	9.30	26.00	5.58	7.55
7	Whole Pressed Peanut Cake.....	35.37	10.05	21.12	20.50	8.55	4.41
7	Whole Pressed Peanut Meal.....	33.09	10.71	22.41	19.95	7.57	6.27
35	Rice Bran.....	12.58	13.28	13.99	39.63	9.56	10.96
1	Rice Cone Meal.....	15.13	18.64	7.57	39.61	10.01	9.04
16	Rice Polish.....	12.96	10.54	2.73	58.83	9.39	5.55
23	Wheat Bran.....	17.06	3.79	7.54	56.29	10.47	4.85
32	Wheat Bran and Screenings.....	17.13	3.95	8.15	54.01	11.38	5.38
3	Wheat Chops.....	16.26	1.89	3.53	65.46	10.42	2.44
16	Wheat Mixed Feed.....	17.12	4.22	7.58	55.39	10.93	4.76
42	Wheat Shorts.....	17.66	4.08	4.22	60.11	10.19	3.74
1	Sorgo Chops.....	8.95	3.13	2.88	72.56	10.89	1.59

*NOTE:—The average analyses of cottonseed meal and cottonseed cake shown in this table includes all samples, many of which were of very low quality. The manufacturers of these low grade products were required to register, tag and sell the same as cottonseed meal and hulls or cottonseed cake and hulls, as the case may have been. Prosecution often followed. A list of those convicted or pleas of guilty entered, as reported to us by the county officers, is shown on page 56.

It will be observed that some of the above averages are below the standard required by the Feed Control Service. This is explained by the fact that the samples analyzed include the inspectors' samples, many of which were found to be below the requirements.

LIST OF MANUFACTURERS WHO WERE CONVICTED OR PLEAD GUILTY TO
FALSELY LABELING FEEDSTUFFS SOLD IN TEXAS FROM SEPTEMBER
1, 1915, TO AUGUST 31, 1916.

Bay City Rice Milling Company, Bay City, Texas.
Beaumont Cotton Oil Company, Beaumont, Texas.
Bryan Cotton Oil & Fertilizer Company, Bryan, Texas.
Continental Oil & Cotton Company, Abilene, Texas.
Continental Oil & Cotton Company, Colorado, Texas. (*Two cases.*)
Western Cotton Oil and Gin Company, Haskell, Texas.
Hill County Cotton Oil Company, Hillsboro, Texas. (*Two Cases.*)
Honey Grove Cotton Oil Company, Honey Grove, Texas.
Jacksboro Oil & Milling Company, Jacksboro, Texas.
Magnolia Cotton Oil Company, Houston, Texas.
Mart Cotton Oil Company, Mart, Texas.
Memphis Cotton Oil Company, Memphis, Texas. (*Two cases.*)
Midlothian Oil & Gin Company, Midlothian, Texas.
Planters Cotton Oil Company, Dallas, Texas.
Planters Cotton Oil Company, Bonham, Texas.
Quanah Cotton Oil Company, Quanah, Texas. (*Three cases.*)
San Saba Cotton Oil Company, San Saba, Texas.
Southland Cotton Oil Company, Decatur, Texas.
Terrell Cotton Oil Company, Terrell, Texas.
Tyler Cotton Oil Company, Tyler, Texas.
Vernon Cotton Oil Company, Vernon, Texas. (*Two cases.*)

LIST OF MANUFACTURERS AGAINST WHOM COMPLAINTS WERE ENTERED
BUT CASES DID NOT COME TO TRIAL FOR REASONS GIVEN.

Palestine Grain Company, Palestine, Texas: *Could not get County Attorney to bring the case to trial.*

Stamford Mill and Elevator Company, Stamford, Texas: *Cases dismissed by County Attorney.* (*Two cases.*)

Planters Oil Company, Weatherford, Texas: *Could not get County Attorney to bring the case to trial.*

FEED CONTROL SERVICE ANALYSES.

The following pages contain a detailed report of analyses completed during the season of 1915-16. Please note that this list is arranged alphabetically by towns, showing the names of all manufacturers alphabetically in each city or town. An alphabetical list of all firms registered is shown on pages 22 to 54 of this bulletin. Figures in *black face type* show wherein the manufacturer has not maintained his guarantee.

ACKNOWLEDGMENT.

The analytical work involved in the preparation of this bulletin was done under the direction of Dr. G. S. Fraps, State Chemist and Chemist to the Experiment Station.

The arrangement and compilation of all data in this bulletin was done under the supervision of James Sullivan, Executive Secretary of the Feed Control Service.

TABLES OF ANALYSES

TEXAS AGRICULTURAL EXPERIMENT STATION.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Ex- tract.	Ingredients.	Remarks.
586A	Cottonseed Meal.	Continental Oil and Cotton Co.	Guarantee	44.00	7.00	11.00	24.00	.....	Adulterated hulls.
22W	Cottonseed Meal.		Found.....	40.82	9.85	11.91	25.32	.....	Adulterated hulls.
21W	Cottonseed Meal.		Found.....	41.81	8.16	12.19	25.22	.....	Adulterated hulls.
9W	Cottonseed Meal.		Found.....	40.19	6.94	13.78	26.97	.....	Adulterated hulls.
25W	Cottonseed Meal.		Found.....	40.63	9.29	12.15	25.33	.....	Adulterated hulls.
24W	Cottonseed Meal.		Found.....	38.31	7.14	14.91	27.17	.....	Adulterated hulls.
586B	Cottonseed Cake.		Guarantee	44.00	7.00	11.00	24.00	.....	Adulterated hulls.
26W	Cottonseed Cake.		Found.....	42.29	7.64	11.69	24.63	.....	Adulterated hulls.
50P	Cottonseed Cake.		Found.....	43.60	6.58	11.05	26.59	.....	Adulterated hulls.
586C	Mixed Feed.		Guarantee	10.60	3.00	40.00	30.00	Cottonseed meal and cottonseed hulls	Adulterated hulls.
10W	Mixed Feed.	G. W. Gilliland.	Found.....	12.82	3.16	41.33	31.11	.....
586D	Cottonseed Meal and Hulls		Guarantee	35.00	5.00	20.00	20.00	.....
586D	Cottonseed Meal and Hulls		Found.....	41.13	8.27	12.91	25.46	.....
586E	Cottonseed Cake and Hulls		Guarantee	35.00	5.00	20.00	20.00	.....
596E	Cottonseed Cake and Hulls		Found.....	42.29	7.06	12.61	25.71	.....
992A	Milo Chops.	G. W. Gilliland.	Guarantee	10.00	2.50	3.00	71.00	.....
992A	Milo Chops.		Found.....	12.27	3.21	2.23	70.08	.....
843A	Mixed Chicken Feed.	L. D. Kennedy.	Guarantee	9.00	4.00	3.00	70.00	Wheat, milo, corn, oyster shell.	
186A	Milo Chops.		Guarantee	10.00	2.50	3.00	71.00	.....
186A	Milo Chops.	C. S. Lee Grain and Ele- vator Co.	Found.....	11.88	3.10	2.55	70.51	.....
186B	Mixed Feed.		Guarantee	14.00	2.00	6.00	50.00	Wheat bran and milo chops.	
186B	Mixed Feed.		Found.....	12.40	3.97	4.45	66.52	.....
186C	Corn Chops.		Guarantee	9.00	3.50	3.00	70.00	.....
186C	Corn Chops.		Found.....	10.16	4.13	3.26	71.46	.....
888A	Milo Chops.	C. S. Lee Grain and Ele- vator Co.	Guarantee	9.00	2.50	3.50	71.00	.....
888B	Crushed Milo Heads.		Guarantee	8.50	2.50	7.50	66.00	.....
888C	Mixed Feed.		Guarantee	13.00	3.00	6.00	62.00	Wheat bran and milo chops.	

1888D Economy Mixed Feed.....	T. N. Ramsey.....	Guarantee	8.00	2.00	7.00	65.00	Crushed milo heads and molasses.....
23W Economy Mixed Feed.....		Found.....	10.06	2.62	4.65	68.27	
1888D Economy Mixed Feed.....		Found.....	9.88	1.83	5.73	65.47	
1888E Improved Economy Mixed Feed.....		Guarantee	8.50	2.25	8.00	60.00	Oats, crushed milo heads and molasses.....
1888E Improved Economy Mixed Feed.....		Found.....	10.96	2.77	6.92	66.37	
1972A Milo Chops.....	Wiley Turner.....	Guarantee	10.00	2.50	3.00	70.50	

ABILENE, KANSAS.

2061B Gray Shorts and Wheat Screenings.....		Guarantee	15.00	3.00	6.00	50.00	
2061B Gray Shorts and Wheat Screenings.....		Found.....	17.80	3.51	5.35	58.53	
2061A Wheat Bran and Screenings.....		Guarantee	14.50	3.00	9.00	49.00	
2061A Wheat Bran and Screenings.....		Found.....	17.10	3.48	9.84	51.19	
2061C Wheat White Shorts and Wheat Screenings.....		Guarantee	15.00	3.00	6.00	50.00	
2061C Wheat White Shorts and Wheat Screenings.....	Abilene Flour Mills Co.....	Found.....	16.56	3.40	2.36	66.46	
2061D Wheat Mixed Feed and Screenings.....		Guarantee	16.00	3.00	9.00	49.00	
2061D Wheat Mixed Feed and Screenings.....		Found.....	17.49	3.77	7.97	54.05	
413A Wheat Shorts.....		Guarantee	16.00	3.50	6.00	60.00	
413B Corn Chops.....		Guarantee	9.00	3.50	3.50	70.00	
413C Wheat Bran.....	Abilene Milling Co.....	Guarantee	14.50	3.50	10.00	50.00	
1554A Wheat Brown Shorts.....	Security Flour Mills Co.....	Guarantee	15.50	4.00	5.00	55.00	
1554C Corn Chops.....		Guarantee	9.00	3.00	3.50	70.00	
1554D Wheat Bran.....		Guarantee	15.00	3.50	10.00	50.00	

ABERNATHY, TEXAS.

2081A Milo Chops.....	Abernathy Corn Mills.....	Guarantee	10.00	2.50	3.00	71.00	
2081A Milo Chops.....		Found.....	9.81	2.77	2.09	72.20	

ADA, OKLAHOMA.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen- Free Extract.	Ingredients.	Remarks.
1015A	Corn Chops.....	Ada Milling Co.....	Guarantee	9.00	4.00	3.00	70.00		
1015B	Wheat Mixed Feed.....		Guarantee	16.44	4.10	8.24	58.31		

ALBANY, TEXAS.

1417A	Corn Chops.....	R. E. Nail.....	Guarantee	9.00	4.00	3.00	70.00		
1417B	Kafir Chops.....		Guarantee	9.50	3.00	2.75	71.00		
1417C	Milo Chops.....		Guarantee	9.00	2.00	2.00	70.00		
1417D	Mixed Feed.....		Guarantee	13.50	3.00	6.00	59.50	Wheat bran, ground wheat, Kafir chops.	
1417E	Corn Chops and Corn Bran		Guarantee	9.00	4.00	4.00	70.00		
1417F	Milo Chops and Corn Bran.		Guarantee	9.00	2.50	2.50	70.00		

ALEX, OKLAHOMA.

1768A	Corn Chops.....	M. H. Smith.....	Guarantee	9.54	3.99	2.58	70.98		
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ALICE, TEXAS.

1050A	Cold Pressed Cottonseed...	Alice Cotton Oil Co.....	Guarantee	28.00	5.50	28.00	27.00		
31T	Cold Pressed Cottonseed...		Found....	28.25	6.15	25.54	28.33		

ALTO, TEXAS.

1886A	Cottonseed Meal.....	Alto Cotton Oil Co.....	Guarantee	44.00	7.00	11.00	22.00		
1886B	Mixed Feed.....		Guarantee	14.00	3.75	9.00	69.00	Corn, cob chops, cottonseed meal.	
1886C	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00		
2124A	Corn Chops.....	Berryman and Walters....	Guarantee	9.00	3.50	3.00	70.00		
2124A	Corn Chops.....		Found....	9.08	3.02	1.00	69.37		

ALTON, ILLINOIS.

1031A	Wheat Bran.....	Sparks Bros.....	Guarantee	14.50	4.00	10.00	50.00
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ALTUS, OKLAHOMA.

822A	Alfalfa Meal.....	Altus Alfalfa Milling Co.....	Guarantee	12.00	1.75	32.00	30.00	Corn chops, cottonseed meal, alfalfa meal, milo, corn husks.
822B	J. C. Dairy Feed.....		Guarantee	13.00	3.00	20.00	45.00	
822C	Milo Palo Feed.....		Guarantee	11.00	3.50	14.00	56.00	Corn chops, oats, cottonseed meal, alfalfa meal.
822D	Corn Chops.....		Guarantee	9.00	4.00	3.00	70.00	
109A	Corn Chops.....	Leger Mill Co.....	Guarantee	9.00	3.00	2.50	72.00	Wheat bran and shorts.
109B	Wheat Mixed Feed.....		Guarantee	16.00	3.85	8.40	54.00	
109C	Milo Chops.....		Guarantee	10.00	2.50	2.90	72.50	Wheat bran, shorts and screenings.
109D	Wheat Mixed Feed and Screenings.		Guarantee	16.00	3.85	8.40	54.00	

ALVA, OKLAHOMA.

127A	Corn Chops.....	Alva Roller Mills.....	Guarantee	9.00	3.75	3.00	70.00
127B	Wheat Shorts.....		Guarantee	15.23	3.38	3.63	63.11
127C	Wheat Bran.....		Guarantee	16.42	3.62	6.03	58.58
127D	Wheat Bran.....		Guarantee	16.50	4.00	9.00	55.00

ALVARADO, TEXAS.

219A	Cottonseed Meal.....	Alvarado Cotton Oil Mill.	Guarantee	45.00	7.00	11.00	22.00	Adulterated hulls.
219B	Cottonseed Meal.....		Found....	43.94	6.54	11.53	25.20	
219C	Cracked Cottonseed Cake..		Guarantee	45.00	7.00	11.00	22.00	
219C	Cottonseed Meal and Hulls		Guarantee	43.00	7.00	12.00	23.00	
219D	Cottonseed Meal and Hulls		Found....	43.50	7.56	11.36	25.64	
219D	Cottonseed Cake and Hulls		Guarantee	43.00	7.00	12.00	23.00	
219D	Cottonseed Cake and Hulls		Found....	45.78	7.50	9.22	24.02	
2150A	Corn Chops.....	T. L. Bramblett.....	Guarantee	9.50	3.50	3.00	70.00	
2150A	Corn Chops.....		Found....	10.06	4.24	2.43	71.09	

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen.	Ingredients.	Remarks.
392A	Corn Chops.	Alvin Mercantile Co.	Guarantee	9.47	3.85	3.44	69.12		
300A	Corn Chops.	W. E. Davis.	Guarantee	9.00	3.50	3.00	70.00		
824A	Corn Chops.	Drake and Sons.	Guarantee	9.00	4.00	3.00	70.00		
824B	Cottonseed Meal.		Guarantee	44.00	7.00	11.00	24.00		
2079A	Mixed Head Chops.	J. Menefee.	Guarantee	9.50	2.45	7.65	64.00	Milo and kafir heads.	
2069A	Mixed Head Chops.		Found.	8.45	2.50	7.25	63.73		
2079B	Milo Head Chops.		Guarantee	9.75	2.40	7.50	65.00		
2079B	Milo Head Chops.		Found.	10.03	2.58	5.41	68.61		

ALVORD, TEXAS.

1471A	Milo Chops.	Calvin King.	Guarantee	9.50	2.50	3.00	71.00		
1471B	Corn Chops.		Guarantee	9.00	3.00	3.50	70.00		

AMARILLO, TEXAS.

996A	Cottonseed Meal.	Amarillo Commercial Co.	Guarantee	44.00	7.00	11.00	23.00		
996A	Cottonseed Meal.		Found.	43.57	7.11	10.11	25.91		
996B	Cottonseed Cake.		Guarantee	44.00	7.00	11.00	23.00		
996B	Cottonseed Cake.		Found.	43.77	6.48	10.96	25.58		
2179A	Corn Chops.		Guarantee	9.00	3.50	3.00	70.00		
2179A	Corn Chops.		Found.	10.64	3.74	2.49	77.81		

2179B	Kafir Chops.....	American Coal and Grain Co.	Guarantee	10.50	2.75	3.00	69.00	.....
2179B	Kafir Chops.....		Found....	10.63	2.82	2.41	72.96	.....
2179C	Milo Chops.....		Guarantee	10.00	2.50	3.00	71.00	.....
2179C	Milo Chops.....		Found....	10.19	2.78	2.59	73.15	.....
2179D	Feterita Chops.....		Guarantee	11.00	2.50	3.00	69.00	.....
2179D	Feterita Chops.....		Found....	11.25	2.61	1.97	72.58	.....
1036A	Corn Chops.....	Early Grain and Elevator Co.	Guarantee	9.00	3.50	3.00	70.00	.....
1036B	Kafir Chops.....		Guarantee	10.00	2.00	2.75	71.00	.....
1036C	Milo Chops.....		Guarantee	10.12	2.00	3.12	72.79	.....
847A	Corn Chops.....	Thomas Giles.	Guarantee	9.00	4.00	3.00	70.00	.....
847B	Kafir Chops.....		Guarantee	9.00	3.00	3.00	70.00	.....
847C	Kafir Head Chops.....		Guarantee	8.50	2.50	6.00	65.00	.....
847D	Milo Chops.....		Guarantee	9.00	3.50	3.50	70.00	.....
847E	Milo Head Chops.....		Guarantee	8.50	2.50	6.00	65.00	.....
2077A	Corn Chops.....	Lemons Grain and Coal Co.	Guarantee	9.00	3.50	3.00	70.00	.....
2077A	Corn Chops.....		Found....	9.88	4.54	2.50	69.35	.....
2077B	Milo Chops.....		Guarantee	10.00	2.50	3.00	71.00	.....
2077B	Milo Chops.....		Found....	12.21	2.94	2.39	69.61	.....
395A	Milo Chops.....	Panhandle Grain and Elevator Co.	Guarantee	10.00	2.50	3.00	70.50	.....
395A	Milo Chops.....		Found....	11.07	3.01	2.16	70.64	.....
99P	Milo Chops.....		Found....	11.06	3.01	2.14	72.06	.....
395B	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....
395C	Mixed Chops.....		Guarantee	10.00	3.00	4.00	68.50	Milo and wheat chops.....
395C	Mixed Chops.....		Found....	13.13	2.72	2.34	68.69	.....

ANADARKO, OKLAHOMA.

1170A	Corn Chops.....	Anadarko Milling Co.....	Guarantee	9.00	3.50	3.50	70.00	.....
1170B	Wheat Bran.....		Guarantee	15.00	3.50	10.00	50.00	.....

ANAHEIM, CALIFORNIA.

1813A	Dried Molasses Beet Pulp.....	Anaheim Sugar Co.....	Guarantee	8.00	5.00	20.00	60.00
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ANDREWS, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
1951A	Milo Chops.....	Logsdon and Son.....	Guarantee	10.00	2.50	3.00	70.50		
1951B	Milo and Feterita Chops....		Guarantee	10.25	2.50	3.00	70.00		
ANNA, TEXAS.									
933A	Corn Chops.....	Greer Moore Elevator Co.....	Guarantee	9.50	3.98	3.00	70.00		
ANSON, TEXAS.									
662A	Corn Chops.....	Anson Milling Co.....	Guarantee	9.00	3.50	3.00	70.00		
662B	Milo Head Chops.....		Guarantee	9.22	2.44	6.51	60.55		
662C	Kafir Chops.....		Guarantee	9.00	2.50	3.50	70.00		
662D	Milo Chops.....		Guarantee	9.00	2.50	3.50	70.00		
662E	Corn Bran.....		Guarantee	9.00	5.00	10.50	63.00		
662F	Chicken Feed.....		Guarantee	9.00	3.00	3.00	70.00	Corn chops, wheat, milo and kafir.	
ANTHONY, NEW MEXICO.									
1121A	Wheat Bran.....	C. E. Miller.....	Guarantee	10.06	4.18	5.41	61.25		
APACHE, OKLAHOMA.									
212A	Corn Chops.....	Apache Milling Co.....	Guarantee	9.00	3.00	3.00	70.00		
212B	Wheat Bran.....		Guarantee	14.50	3.50	10.00	50.00		
212C	Wheat Mixed Feed.....		Guarantee	14.50	4.00	5.00	60.00	Wheat bran and shorts.	
212D	Wheat Shorts.....		Guarantee	14.50	3.50	5.00	60.00		
ARAPAH, OKLAHOMA.									
1138A	Corn Chops.....	Arapaho Mill and Elevator Co.	Guarantee	9.00	3.50	3.50	70.00		
1138B	Alfalfa Meal.....		Guarantee	13.50	1.75	30.00	36.00		
1138C	Alcorn Mixed Feed.....		Guarantee	11.50	2.00	15.00	50.00	Corn chops and alfalfa meal.	
1138D	Kafir Chops.....		Guarantee	9.50	2.50	3.50	60.00		

ARCHER CITY, TEXAS.

2141A	Mixed Wheat Bran and Shorts.	Forbes Milling Co.	Guarantee	16.00	3.60	8.00	55.00	
2141A	Mixed Wheat Bran and Shorts.		Found	18.61	3.69	7.08	54.80	
2141B	Milo Chops.		Guarantee	10.00	2.50	3.00	71.00	
2141B	Milo Chops.		Found	11.08	2.51	2.27	70.04	
2141C	Corn Chops.		Guarantee	9.50	3.50	3.00	70.00	
2141C	Corn Chops.		Found	10.44	4.25	2.40	70.04	

ARDMORE, OKLAHOMA.

753A	Corn Chops.	Ardmore Milling Co.	Guarantee	9.00	4.00	3.00	70.00	
753B	Wheat Bran.		Guarantee	14.50	3.50	10.00	50.00	

ARKADELPHIA, ARKANSAS.

869A	Corn Chops.	Arkadelphia Milling Co.	Guarantee	9.00	3.50	3.00	70.00	
869B	Hominy Feed.		Guarantee	11.00	6.50	6.00	60.00	
869C	Wheat Shorts.		Guarantee	15.00	3.75	5.00	55.00	
869D	Wheat Bran.		Guarantee	15.00	3.50	10.00	55.00	
869E	Corn and Oat Mixed Feed.		Guarantee	9.00	3.50	14.00	65.00	Corn chops, hominy feed, oat hulls, oat shorts, oat middlings.
869F	Dandy Mixed Feed (S. S.)		Guarantee	12.00	3.00	15.00	50.00	Wheat bran, hominy feed and ground rice hulls.
869G	Dandy Mixed Feed (B. B.)		Guarantee	13.50	3.25	14.50	50.00	Wheat bran, hominy feed and ground rice hulls.
869H	Bon Ami Little Chick Poultry Feed.		Guarantee	11.00	3.50	5.00	65.00	Cracked wheat, corn and oats, kafir and milo.
869I	Wheat Bran, Hominy Feed and Screenings.		Guarantee	14.00	3.00	10.00	50.00	
869J	Glover Leaf Mixed Feed.		Guarantee	14.00	3.50	9.00	50.00	Wheat bran, shorts and hominy feed
869K	Chanticleer Scratch Grain Poultry Feed.		Guarantee	11.00	3.50	5.00	65.00	Cracked wheat, corn, oats, kafir and milo.
869L	Corn Chops, Chaff and Hominy Feed.		Guarantee	8.00	3.00	6.00	70.00	

ARKANSAS CITY, KANSAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitrogen Free Extract.	Ingredients.	Remarks.
454A	Corn Chops.	Arkansas City Milling Co.	Guarantee	10.00	3.00	4.00	70.00	.....
454B	Wheat Bran.		Guarantee	15.00	3.00	10.00	55.00	.....
454C	Corn Chops and Corn Bran		Guarantee	9.50	3.90	2.50	72.10	.....
454D	Wheat Shorts and Screenings		Guarantee	17.10	4.00	4.20	60.90	.....
454E	Wheat Mixed Feed and Screenings.		Guarantee	16.50	4.00	9.00	54.60	.....
454F	Wheat Bran and Screenings		Guarantee	16.20	3.80	8.50	54.60	.....

ARLINGTON, TEXAS.

808A	Corn Chops.	Arlington Light, Power, Ice and Water Co.	Guarantee	9.00	4.00	3.00	70.00	.....
1725A	Corn Chops.	H. B. and W. M. Boston.	Guarantee	9.00	3.50	3.00	70.00	.....
936A	Corn Chops.	C. W. Duke.	Guarantee	9.00	4.00	3.00	70.00	.....
498A	Corn Chops.	R. A. Randol.	Guarantee	10.94	3.27	2.68	72.83	.....
498B	Corn Bran.		Guarantee	8.56	3.07	12.68	64.56	.....
1221A	Corn Chops.	Chas. Rogers.	Guarantee	9.00	3.00	3.50	70.00	.....

ARTESIAN, NEW MEXICO.

856A	Alfalfa Meal.	Artesian Alfalfa Milling Co.	Guarantee	13.00	1.50	30.00	46.00	.....
856B	White Mule Stock Feed.		Guarantee	12.00	2.10	21.00	48.00	Milo, kafir and alfalfa meal.	

ARTHUR CITY, TEXAS.

1701A	Corn Chops.	D. C. Beasley.	Guarantee	9.00	3.50	3.00	70.00	
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ASHDOWN, ARKANSAS.

827A	Cottonseed Meal.....	United Oil Mills.....	Guarantee	44.00	7.00	11.00	22.00
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ASH GROVE, MISSOURI.

250A	Wheat Shorts.....	Ash Grove Milling Co.....	Guarantee	15.00	4.00	5.00	58.00
250B	Wheat Bran.....		Guarantee	14.00	3.50	10.00	50.00

ATCHINSON, KANSAS.

143A	Corn Chops.....	Blair Elevator Co.....	Guarantee	9.00	4.00	3.00	70.00
143B	Wheat Bran.....		Guarantee	14.50	4.00	9.50	53.00
143C	Wheat Shorts.....		Guarantee	15.00	4.00	6.00	57.00
58A	Corn Chops.....	Blair Milling Co.....	Guarantee	9.00	3.00	3.10	69.00
58B	Wheat Bran.....		Guarantee	14.00	3.50	9.50	54.00
58C	Wheat Shorts.....		Guarantee	14.50	3.50	9.00	56.00
58D	Feed Meal.....		Guarantee	9.50	6.50	5.50	60.50
58E	Alfalfa Meal.....		Guarantee	15.00	1.50	32.00	40.00
58F	Arkona Feed.....		Guarantee	12.51	3.25	19.47	51.14
							Alfalfa, wheat bran, hominy feed and corn chops.
58G	Blair's Mixed Feed.....		Guarantee	13.00	3.00	7.50	56.00
58H	Blair's Hominy Feed.....		Guarantee	9.00	6.50	7.00	60.00
086A	Standard Wheat Shorts.....	Cain Mill Co.....	Guarantee	16.00	3.50	5.50	55.50
086B	Wheat Bran and Screenings.....		Guarantee	14.50	3.50	10.00	53.50
086C	Wheat Mixed Feed.....		Guarantee	14.50	3.50	10.00	50.00
043A	Wheat Bran.....	Corn Belt Grain Co.....	Guarantee	14.00	3.00	10.00	50.00
106A	Corn Chops.....	Lukens Milling Co.....	Guarantee	9.00	3.50	3.50	70.00
106B	Wheat Bran.....		Guarantee	14.50	3.50	10.00	50.00
855A	Corn Chops.....	S. R. Washer Grain Co.....	Guarantee	9.00	3.50	3.50	70.00
855B	Wheat Shorts.....		Guarantee	15.50	3.50	6.00	55.00
855C	Wheat Bran.....		Guarantee	14.50	3.50	10.00	55.00

ATHENS, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
567A	Cottonseed Meal.....	Athens Cotton Oil Co..	Guarantee	44.00	7.00	11.00	22.00	.....
567B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	22.00	.....
567C	Cottonseed Meal and Hulls		Guarantee	44.00	6.00	12.00	22.00	.....
62B	Cottonseed Meal and Hulls		Found.....	41.29	10.59	10.51	24.58	.....
567C	Cottonseed Meal and Hulls		Found.....	43.16	6.92	9.88	25.53	.....
567D	Cottonseed Cake and Hulls		Guarantee	44.00	6.00	12.00	22.00	.....
567D	Cottonseed Cake and Hulls		Found.....	44.54	7.55	10.05	25.03	.....

AUBREY, TEXAS.

229A	Wheat Bran and Shorts.....	Audrey Milling Co.....	Guarantee	14.50	3.50	10.00	50.00	.....
229B	Corn Chops.....		Guarantee	9.00	3.50	3.50	70.00	.....
229C	Wheat Bran Shorts and Corn Bran.		Guarantee	14.50	3.50	10.00	50.00	.....
229D	Wheat Bran, Corn Bran and Screenings.		Guarantee	13.00	3.00	12.00	51.00	.....
229E	Wheat Bran and Screenings		Guarantee	14.00	3.00	11.00	52.00	.....
229F	Poultry Food.....		Guarantee	9.00	2.75	3.00	71.00	Corn chops, wheat, milo and kafir.	
229G	Wheat Shorts.....	Audrey Milling Co.....	Guarantee	17.00	3.50	4.50	60.00	.....
229H	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50	.....
229I	Mixed Feed.....		Guarantee	13.00	3.00	6.00	63.00	Milo chops, wheat bran, corn bran.	
229J	Mixed Chops.....		Guarantee	10.00	2.75	3.00	70.00	Milo and corn chops.	
229J	Mixed Chops.....		Found.....	10.06	3.15	2.30	72.33	.....

AURORA, MISSOURI.

864A	Wheat Bran.....	Aurora Milling Co.....	Guarantee	16.00	3.13	8.48	53.00	.....
864B	Wheat Shorts.....		Guarantee	15.00	3.16	7.90	60.00	.....
864C	Mixed Feed.....		Guarantee	16.00	3.50	9.00	53.00	Wheat Bran and shorts.	

AUSTIN, TEXAS.

Wheat Bran.....		Majestic Milling Co.....		Guarantee		15.50		3.50		10.00		54.00	
Wheat Shorts.....				Guarantee		19.00		5.00		6.00		55.00	
Mixed Feed.....				Guarantee		17.00		4.00		8.00		53.00 Wheat bran and shorts.....	
AUSTIN, TEXAS.													
Cottonseed Meal.....		Austin Oil Manufacturing Co.		Guarantee		44.00		7.00		11.00		23.00	
450A	Cottonseed Meal.....			Found....		46.98		7.38		9.09		25.70	
450B	Cottonseed Cake.....			Guarantee		44.00		7.00		11.00		23.00	
38B	Cottonseed Cake.....			Found....		43.63		6.22		11.81		25.78	
Corn Chops.....		Capital City Mills.....		Guarantee		9.00		3.00		2.52		71.71	
331A	Corn Bran.....			Guarantee		8.00		4.00		10.79		62.35	
331C	Mixed Chicken Feed.....			Guarantee		10.00		3.00		3.00		65.00 Wheat and corn chops.....	
331D	Milo Meal.....			Guarantee		9.50		2.75		3.00		71.00	
Cottonseed Meal.....		Farmers and Ginners Cotton Oil Co.		Guarantee		44.00		7.00		11.00		20.00	
1049A	Screened Cottonseed Cake.....			Guarantee		44.00		7.00		11.00		20.00	
1049C	Plow Boy Mixed Feed.....			Guarantee		9.50		1.50		42.00		30.00 Cottonseed meal and hulls.....	
Corn Chops.....				Guarantee		9.00		3.50		3.00		70.00	
1712A	Ear Corn Chops.....			Guarantee		7.00		3.00		9.00		67.00	
1712B	Corn Bran.....			Guarantee		8.50		4.00		12.00		65.00	
1712D	Mixed Cow Feed.....			Guarantee		9.50		2.50		42.00		30.00 Cottonseed meal and hulls.....	
2B	Mixed Cow Feed.....			Found....		10.35		1.62		42.83		31.77	
1712C	Chicken Feed.....	H. C. Greer.....		Guarantee		10.00		2.50		3.00		70.00 Corn chops, milo, wheat and sunflower seed.....	
1712F	Milo Chops.....			Guarantee		9.50		2.50		3.00		71.00	
1712F	Milo Chops.....			Found....		9.49		3.12		2.96		71.35	
1712G	Mixed Chops.....			Guarantee		9.50		3.00		3.50		68.00 Corn and milo chops.....	
1712G	Mixed Chops.....			Found....		9.75		3.67		2.43		71.17	
Corn Chops.....		M. & M. Horse Feed.....		Guarantee		9.00		3.50		3.00		70.00	
11183A	M. & M. Horse Feed.....			Guarantee		18.75		4.00		15.00		60.25 Alfalfa, molasses, corn chops, rolled oats and cottonseed meal.....	
11183B	Mixed Chicken Feed.....			Guarantee		12.12		2.94		2.81		69.58 Milo, wheat, corn chops and sunflower seed.....	
11183C	Milo Chops.....			Guarantee		10.00		2.50		3.00		71.00	
11183D	Milo Chops.....			Found....		11.81		3.23		1.91		69.11	

AUSTIN, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen- Free Extract.	Ingredients.	Remarks.
39A	Big Chicken Feed.....	C. J. Martin.....	Guarantee	10.50	3.35	3.32	70.85	Corn chops, milo and wheat.....	
39B	Baby Chick Feed.....		Guarantee	11.18	3.21	4.02	69.76	Corn, milo and wheat chops.....	
277A	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00		
88B	Corn Chops.....		Found.....	9.56	4.21	2.25	71.00		
277B	Wheat Bran.....		Guarantee	16.00	3.50	8.00	56.00		
277C	Wheat Shorts.....		Guarantee	15.28	3.38	3.63	63.11		
277D	Mixed Chicken Feed.....		Guarantee	10.00	2.50	3.00	70.00	Corn chops, screenings and milo.....	
277E	Wheat Bran and Screenings		Guarantee	16.00	3.50	8.00	56.00		
86B	Wheat Bran and Screenings		Found.....	18.00	4.72	8.94	52.28		
277F	Corn Bran.....		Guarantee	8.75	4.90	4.50	70.00		
277G	Corn Chops and Corn Bran	Quality Mills.....	Guarantee	9.00	6.00	8.00	60.00		
277H	Milo Chops.....		Guarantee	9.00	2.50	3.00	70.00		
277H	Milo Chops.....		Found.....	9.38	3.23	2.60	71.13		
277I	Corn and Milo Chops.....		Guarantee	9.00	2.75	3.00	70.00		
277I	Corn and Milo Chops.....		Found.....	9.63	3.63	2.54	70.82		
170A	Corn Chops.....	W. E. Riddle.....	Guarantee	9.00	3.50	3.50	70.00		
1647A	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00		
1647B	Chicken Feed.....		Guarantee	10.50	2.50	3.25	68.00	Corn chops, milo, kafir and wheat.....	
1647C	Corn and Milo Chops.....	Robinson Brothers.....	Guarantee	9.00	3.00	3.25	70.00		
1647D	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50		
1647E	Chicken Feed.....		Guarantee	10.00	3.00	3.00	67.00	Wheat, milo, kafir, corn chops, red top cane seed.	
1647F	Corn Chops and Corn Bran		Guarantee	9.40	3.80	4.40	76.60		
1647F	Corn Chops and Corn Bran		Found.....	9.88	4.94	3.85	68.56		

AUSTWELL, TEXAS.

1840A	Cottonseed Meal.....	{	Guarantee	44.00	7.00	11.00	23.00	.....
530T	Cottonseed Meal.....	{	Found....	44.73	7.00	9.40	24.78	.....
1840B	Cottonseed Cake.....	{	Guarantee	44.00	7.00	11.00	23.00	.....

Austwell Oil Mill.

BALLINGER, TEXAS.

327A	Cottonseed Meal.....	{	Guarantee	44.00	7.00	11.00	23.00	.....
13W	Cottonseed Meal.....	{	Found....	42.88	7.31	11.27	26.89	.....
327B	Cottonseed Cake.....	{	Guarantee	44.00	7.00	11.00	23.00	.....
12W	Cottonseed Cake.....	{	Found....	42.97	6.68	12.61	25.47	.....
327C	Jersey Cream Cow Feed....	{	Guarantee	9.50	3.00	45.00	30.00	Cottonseed meal and hulls.....
11W	Jersey Cream Cow Feed....	{	Found....	11.88	2.37	41.89	31.67	.....

Ballinger Cotton Oil Co....

Adulterated hulls.

Adulterated hulls.

BALMORHEA, TEXAS.

1371A	Alfalfa Meal.....	{	Guarantee	13.00	1.70	30.00	35.00
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Toyah Valley Alfalfa Milling Co.

BANDERA, TEXAS.

1350A	Corn Chops.....	{	Guarantee	9.00	3.00	3.50	70.00
1350B	Corn Bran.....	{	Guarantee	8.00	3.50	12.00	60.00	.....
1350C	Crushed Oats.....	{	Guarantee	11.00	3.75	10.00	55.00	.....

E. T. Peters.

BANGS, TEXAS.

2108A	Corn Chops.....	{	Guarantee	9.50	3.50	3.00	70.00	.....
2108A	Corn Chops.....	{	Found....	10.75	3.54	2.08	72.01	.....
2108B	Barley Chops.....	{	Guarantee	11.00	1.50	6.00	65.00	.....
2108B	Barley Chops.....	{	Found....	12.93	1.84	7.14	65.93	.....
2108C	Milo Chops.....	{	Guarantee	10.00	2.50	3.00	71.00	.....
2108C	Milo Chops.....	{	Found....	11.44	2.74	2.06	71.43	.....

T. F. Fitzgerald.

F. W. Schulze.

Corn Chops.....

TEXAS AGRICULTURAL EXPERIMENT STATION.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Extract.	Ingredients.	Remarks.
1712A	Cottonseed Meal.....	Bardwell Cotton Oil Co....	Guarantee	44.00	7.00	11.00	23.00		
1742B	Cottonseed Meal and Hulls.		Guarantee	38.00	8.00	12.50	26.00		
2053A	Corn Chops.....	M. M. Prine.....	Guarantee	9.00	3.50	3.00	70.00		
2053A	Corn Chops.....		Found.....	11.21	4.01	2.13	69.91		
2053B	Corn Bran.....		Guarantee	9.00	5.00	10.00	63.00		
2053B	Corn Bran.....		Found.....	11.06	4.89	8.72	62.13		
1378A	Corn Chops.....	Venable and Whittington..	Guarantee	9.00	3.00	3.50	70.00		
1378B	Corn Bran.....		Guarantee	7.50	4.00	12.00	55.00		
1155A	Corn Chops.....	M. W. Wright & Co.....	Guarantee	9.00	3.50	3.50	70.00		
1155B	Corn Bran.....		Guarantee	7.50	4.00	12.00	55.00		
BARRY, TEXAS.									
904A	Corn Chops.....	Barry Milling Co.....	Guarantee	9.00	4.00	3.00	70.00		
BAESTOW, TEXAS.									
1057A	Milo Head Chops.....	Robert L. McKnight.....	Guarantee	8.50	2.00	6.00	65.00		
1057B	White Kafir Head Chops...		Guarantee	8.50	2.50	8.00	65.00		
1057C	Red Kafir Head Chops....		Guarantee	8.50	2.50	8.00	65.00		
BARTLETT, TEXAS.									
553A	Cold Pressed Cottonseed...	Bartlett Oil Mill.....	Guarantee	21.80	7.00	25.00	27.00		
7B	Cold Pressed Cottonseed...		Found.....	26.55	6.64	23.88	31.76		

1392A	Corn Chops.....	E. H. Cain.....	Guarantee	9.00	3.00	3.50	70.00
1807A	Corn Chops.....	W. J. King.....	Guarantee	9.00	3.50	3.00	70.00

BASTROP, TEXAS.

2158A	Corn Chops.....	Bastrop Milling Co.....	Guarantee	9.00	3.50	3.00	70.00
2158A	Corn Chops.....		Found.....	9.75	4.11	2.55	72.29
554A	Cottonseed Meal.....	Powell Oil Mill.....	Guarantee	44.00	7.00	11.00	22.00
554B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	22.00

BAY CITY, TEXAS.

457A	Rice Polish.....	Bay City Rice Milling Co.	Guarantee	11.00	6.00	4.00	60.00	Adul. rice hulls. Adul. rice hulls. Adul. rice hulls. Adul. rice hulls.
457T	Rice Polish.....		Found.....	13.69	12.20	3.11	55.98	
457T	Rice Bran.....		Guarantee	11.00	10.00	12.00	44.00	
51S	Rice Bran.....		Found.....	14.05	15.99	11.60	38.54	
18T	Rice Bran.....		Found.....	10.94	8.19	15.90	44.14	
42T	Rice Bran.....		Found.....	10.08	10.86	23.77	32.34	
43T	Rice Bran.....		Found.....	9.80	10.18	23.56	33.73	
14T	Rice Bran.....		Found.....	11.22	12.54	19.43	35.45	
47T	Rice Bran.....		Found.....	10.11	10.67	23.09	32.50	
1537A	Corn Chops.....	Bay City Grain Co.....	Guarantee	9.00	3.00	3.50	70.00	Corn and shells..... Rice bran, ground milo and cotton- seed meal.
1537B	Kafir and Milo Chops.....		Guarantee	9.00	2.50	3.50	71.00	
1353A	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	
1353B	Mixed Chops.....		Guarantee	9.00	3.25	4.00	70.00	
1353C	Carter Mixed Feed.....		Guarantee	12.40	7.00	7.50	55.00	
1353D	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50	
1353E	Milo and Corn Chops.....	Carter Grain Co.....	Guarantee	9.00	2.75	3.50	69.00	
1353F	Rice Bran and Rice Hulls..		Guarantee	10.07	7.50	18.50	44.18	
1353H	Milo Head Chops.....		Guarantee	9.50	2.75	7.50	68.00	
1353H	Milo Head Chops.....		Found.....	9.94	2.62	6.42	65.50	
1353I	Wheat Bran and Milo Chops		Guarantee	12.50	3.00	6.00	62.50	
1353I	Wheat Bran and Milo Chops		Found.....	13.81	3.52	5.29	59.84	

BAY CITY, TEXAS, Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitrogen Extract.	Ingredients.	Remarks.
781A	Rice Polish.....	Colorado Valley Rice Mill- ing Co.	Guarantee	12.00	9.00	3.00	60.00		
781B	Rice Bran.....		Guarantee	11.00	10.00	12.00	45.00		
2171A	Corn Chops.....	LeTulle Mercantile Co.....	Guarantee	9.50	3.50	3.00	70.00		
2171A	Corn Chops.....		Found....	9.69	4.56	2.68	71.31		
2171B	Milo Chops.....		Guarantee	10.00	2.50	3.00	71.00		
2171B	Milo Chops.....		Found....	9.99	2.74	2.69	70.81		
2171C	Wheat Bran and Milo Chops		Guarantee	12.50	3.00	6.00	62.50		
2171C	Wheat Bran and Milo Chops		Found....	14.45	3.60	5.92	60.80		
2171D	Kafir Chops.....		Guarantee	10.50	2.75	3.00	69.50		
2171D	Kafir Chops.....		Found....	9.72	3.13	2.38	70.91		

BEASLEY, TEXAS.

1509A	Corn Chops.....	H. W. Ellison.....	Guarantee	9.00	3.50	3.00	70.00		
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BEATRICE, NEBRASKA.

435A	Wheat Shorts.....	Black Brothers.....	Guarantee	15.00	3.00	5.00	60.00		
435B	Wheat Bran.....		Guarantee	14.75	3.50	10.00	52.00		
1309A	Corn Chops.....	Nebraska Corn Products Co.	Guarantee	9.00	3.60	3.00	70.00		

BEAUMONT, TEXAS.

509A	Rice Bran.....	Atlantic Rice Mills Co.....	Guarantee	12.00	10.00	12.00	40.00		
72R	Rice Bran.....		Found....	13.81	14.81	12.04	40.13		
32Y	Rice Bran.....		Found....	13.69	13.34	10.79	42.19		
509B	Rice Polish.....		Guarantee	11.00	6.00	2.50	62.00		
31Y	Rice Polish.....		Found....	13.25	9.33	2.27	58.88		
509C	Ground Rice Hulls.....		Guarantee	2.00	1.00	50.00	20.00		

		Guarantee		40.00	5.00	13.00	25.00		
2040A	Cottonseed Meal and Hulls	Found.	40.25	6.48	12.41	30.20			
2040A	Cottonseed Meal and Hulls	Guarantee.	44.00	7.00	11.00	23.00			
2040B	Cottonseed Meal.	Found.	48.98	6.43	12.02	26.31			
2040B	Cottonseed Meal.	Found.	43.28	6.38	10.11	25.94			
2040B	Cottonseed Meal.	Found.	36.31	6.00	15.80	27.94			
2040C	Cottonseed Meal and Hulls	Guarantee.	41.00	5.00	14.00	24.00			
2040C	Cottonseed Meal and Hulls	Found.	42.44	6.86	9.07	26.17			
2040D	Screened Cottonseed Cake	Guarantee.	41.00	5.00	14.00	24.00			
2040D	Screened Cottonseed Cake	Found.	42.32	7.31	7.79	27.18			
2040E	Screened Cottonseed Cake.	Guarantee.	44.00	7.00	11.00	23.00			
2040E	Screened Cottonseed Cake.	Found.	43.10	9.33	7.35	26.11			
494A	Rice Polish.	Guarantee.	11.00	6.00	3.00	60.00			
29Y	Rice Polish.	Found.	12.94	11.95	2.58	58.92			
494B	Rice Bran.	Guarantee.	12.00	12.00	15.00	38.00			
494B	Rice Bran.	Found.	13.75	15.48	13.57	35.24			
75R	Rice Bran.	Found.	12.69	13.99	14.83	39.01			
30Y	Rice Bran.	Found.	12.94	13.79	9.55	45.69			
494C	Ground Rough Rice.	Guarantee.	7.00	2.00	15.00	50.00			
494D	Mixed Feed.	Guarantee.	9.00	5.50	10.00	52.00			
672A	Corn Chops.	Guarantee.	9.00	4.00	3.00	70.00			
272A	Corn Chops.	Guarantee.	9.00	4.00	3.00	70.00			
272B	Wheat Bran.	Guarantee.	14.50	3.50	10.00	50.00			
272C	Mixed Feed.	Guarantee.	13.00	1.50	16.00	48.00			
272E	Mixed Feed.	Guarantee.	10.00	3.00	16.00	50.00			
272F	Texta Stock Feed.	Guarantee.	12.00	3.00	15.00	54.00			
272G	Poultry Food.	Guarantee.	10.00	2.20	4.00	60.00			
272G	Poultry Food.	Found.	10.38	3.04	3.94	68.26			
272H	Mixed Feed.	Guarantee.	12.00	4.00	10.00	50.00			

Adulterated hulls.
Adulterated hulls.

Beaumont Cotton Oil Mill
Co.

Beaumont Rice Mills

H. S. Blanchett

J. S. Gordan & Co.

BEAUMONT, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
272I	Milo Chops.	J. S. Jordan & Co.—Continued.	Guarantee	10.00	2.50	3.00	70.00	.....
272J	Wheat Bran and Screenings		Guarantee	14.50	3.00	10.00	55.00	.....
272K	Corn and Milo Chops.		Guarantee	9.00	2.50	3.50	70.00	.....
407A	Corn Chops.		Guarantee	9.50	4.00	3.50	68.00	.....
407B	Alfalfa Mixed Feed		Guarantee	11.00	2.25	18.00	47.00	.....
407C	Mixed Feed.		Guarantee	10.50	3.00	16.00	45.00	Wheat bran, chaff and rice polish.	
407D	Wheat Bran.		Guarantee	14.50	3.50	10.00	50.00	.....
407H	Mo-eggs Mixed Feed.		Guarantee	13.00	2.62	2.70	64.41	Wheat, kafir, oats, milo chops and rice.	
407I	Peerless, Mixed Feed.		Guarantee	8.50	3.50	11.00	54.00	Corn chops, cottonseed meal, rice bran, ground rice hulls, molasses, alfalfa meal, brewers grain and salt.	
407J	Peerless, Mixed Feed.		Found.	9.38	3.69	9.51	57.36	.....
407J	Veribest Mixed Feed.		Guarantee	11.05	3.90	7.53	62.38	Alfalfa meal, corn, oats and molasses.	
407K	Jo-Mil Pride Mixed Feed.	J. S. Jordan & Co.—Continued.	Guarantee	15.16	8.50	4.05	54.71	Wheat shorts, rice polish.	
407L	Jo-Mil Steam Cooked Molasses Feed.		Guarantee	8.50	2.50	13.00	54.00	Corn chops, cottonseed meal, rice bran, ground rice hulls, molasses, alfalfa, brewers' grain and salt.	
24Y	Jo-Mil Steam Cooked Molasses Feed.		Found.	9.81	2.75	10.74	56.36	.....
407M	Xlent Steam Cooked Molasses Feed.		Guarantee	10.00	5.00	11.00	51.00	Corn, cottonseed meal, rice bran molasses, alfalfa and salt.	
26Y	Xlent Steam Cooked Molasses Feed.		Found.	9.28	3.07	11.46	54.13	.....	Adulterated hulls.
609R	Xlent Steam Cooked Molasses Feed.		Found.	10.81	5.66	10.33	53.37	.....
407N	Economy Steam Cooked Molasses Feed.		Guarantee	8.50	3.00	11.00	54.00	Milo head chops, rice bran, ground rice hulls, cottonseed meal, mo-	

TEXAS AGRICULTURAL EXPERIMENT STATION.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Extract.	Ingredients.	Remarks.
2033B	Rice Polish.....	{ McFaddin Rice Milling Co.—Continued. }	Found.....	12.38	10.98	3.70	56.59	Rice polish, and ground rough rice screenings.	Adulterated rice hulls.
27Y	Rice Polish.....		Found.....	12.81	9.08	3.04	60.71		
2033C	Mixed Rice Feed.....		Guarantee.....	10.23	8.50	14.34	61.00		
2033C	Mixed Rice Feed.....		Found.....	10.32	7.95	14.66	48.57		
1889A	Rice Bran.....	{ Steinhagen-Houk Rice Milling Co. }	Guarantee.....	11.00	10.00	12.00	45.00		
1889B	Rice Polish.....		Guarantee.....	11.00	9.00	3.00	60.00		
2043A	Rice Polish.....	{ Tyrrell Rice Milling Co.... }	Guarantee.....	11.00	6.00	4.00	60.00		Adulterated rice hulls.
2043A	Rice Polish.....		Found.....	14.94	10.07	3.40	58.25		
2043B	Rice Bran.....		Guarantee.....	11.00	10.00	15.00	42.00		
2043B	Rice Bran.....		Found.....	10.91	10.64	16.80	39.67		
2043C	Rice Bran and Ground Rice Hulls.....		Guarantee.....	9.00	8.00	20.00	35.00		
2043C	Rice Bran and Ground Rice Hulls.....		Found.....	13.45	14.35	15.44	36.37		
BEEVILLE, TEXAS.									
2016A	Corn Chops.....	{ Dugat and Lampton..... }	Guarantee.....	9.00	3.50	3.00	70.00		
2016A	Corn Chops.....		Found.....	9.29	4.29	2.27	71.40		
362A	Cottonseed Meal.....	{ Beeville Cottonseed Oil Mill Co. }	Guarantee.....	44.00	7.00	11.00	23.00		Adulterated hulls.
72T	Cottonseed Meal.....		Found.....	41.44	8.18	12.62	25.09		
73T	Cottonseed Meal.....		Found.....	43.25	9.11	9.76	25.32		
30T	Cottonseed Meal.....		Found.....	41.46	7.11	13.85	26.10		
362B	Cottonseed Cake.....		Guarantee.....	44.00	7.00	11.00	23.00		
320A	Corn Chops.....	{ W. J. Powell & Son..... }	Guarantee.....	9.00	4.00	3.00	70.00		
320B	Corn and Cob Meal.....		Guarantee.....	9.00	3.00	8.00	68.00		
320C	Cane Seed Chops.....		Guarantee.....	9.00	3.00	3.00	70.00		

BELEN, NEW MEXICO.

706A	Wheat Bran.....	John Becker Co.....	Guarantee	14.50	3.50	10.00	50.00
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BELLEVUE, TEXAS.

1941A	Corn Chops.....	Brown and Disham.....	Guarantee	9.00	3.50	3.00	70.00
1941B	Kafir Chops.....		Guarantee	10.25	2.50	2.75	68.75
1941C	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.00

BELLVILLE, TEXAS.

1459A	Cold Pressed Cottonseed.....	Bellville Cotton Oil Co.....	Guarantee	26.00	7.41	22.45	29.00
22T	Cold Pressed Cottonseed...		Found....	26.90	9.16	23.81	27.23
1459B	Ground Cold Pressed Cottonseed.....		Guarantee	26.00	7.00	26.00	28.00
1459B	Ground Cold Pressed Cottonseed.....		Found....	24.98	8.34	23.05	30.17

BELLEVILLE, ILLINOIS.

522A	Wheat Bran.....	Crown Mills Co.....	Guarantee	14.50	3.50	10.00	50.00
522B	Wheat Middlings.....		Guarantee	15.00	4.00	5.00	55.00
1457A	Wheat Bran.....	J. F. Imbs Milling Co.....	Guarantee	14.50	3.50	10.00	50.00
1457B	Wheat Middlings.....		Guarantee	15.00	4.00	5.00	55.00

BELLS, TEXAS.

531A	Corn Chops.....	Bells Mill and Grain Co.....	Guarantee	9.00	4.00	2.80	70.00
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BELTON, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
222A	Cottonseed Meal.....	Belton Oil Co.....	Guarantee	44.00	7.00	11.00	24.00	.....	.....
40B	Cottonseed Meal.....		Found.....	45.25	6.77	10.47	24.20	.....	.....
39B	Cottonseed Meal.....		Found.....	44.75	6.54	10.28	25.05	.....	.....
222B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	24.00	.....	.....
41B	Cottonseed Cake.....		Found.....	46.79	6.18	9.08	24.17	.....	.....
222C	Cottonseed Meal and Hulls		Guarantee	38.00	6.00	15.00	20.00	.....	.....
11B	Cottonseed Meal and Hulls		Found.....	43.06	6.25	11.00	25.48	.....	.....
4S	Cottonseed Meal and Hulls		Found.....	40.72	6.12	12.99	27.09	.....	.....
7S	Cottonseed Meal and Hulls		Found.....	47.74	6.52	13.40	26.26	.....	.....
1561A	Corn Chops.....	Belton Mill and Grain Co..	Guarantee	9.00	3.50	3.00	70.00	.....	.....
1561B	Corn Chops and Corn Bran		Guarantee	9.00	3.50	3.00	70.00	.....	.....
1561C	Little Chicken Feed.....		Guarantee	9.00	3.50	2.95	70.00	Milo, kafir, feterita, corn chops and millet.	.....
1561D	Poultry Food.....		Guarantee	9.25	3.25	3.00	68.50	Milo, feterita, kafir, corn shops and wheat.	.....
1561E	Corn Bran.....	Phillips Milling Co.	Guarantee	9.00	5.00	10.50	63.00	.....	.....
7A	Wheat Bran.....		Guarantee	16.50	5.50	10.00	55.00	.....	.....
7B	Mixed Bran.....		Guarantee	14.50	4.00	10.00	50.00	Wheat and Corn Bran.....	.....
2014A	Corn Chops.....	S. Tims.	Guarantee	9.00	3.50	3.00	70.00	.....	.....
2014A	Corn Chops.....		Found.....	9.18	4.17	2.24	70.11	.....	.....
BENNINGTON, OKLAHOMA.									
1235A	Corn Chops.....	Bennington Grain and Ele- vator Co.	Guarantee	9.00	3.00	3.50	70.00	.....	.....

BERTHOUD, COLORADO.

1081A	Wheat Bran.....	Farmers Milling and Mer-	Guarantee	14.50	3.50	10.00	50.00
70P	Wheat Bran.....	cantile Co.	Found....	14.90	4.02	8.79	54.82

BERTRAM, TEXAS.

1828A	Corn Chops.....	P. M. Rodgers	Guarantee	9.00	3.50	3.00	70.00
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BIG SPRINGS, TEXAS.

1409A	Mixed Chicken Feed.....	W. B. Burns	Guarantee	10.00	2.65	3.00	70.50
							Milo, wheat and corn chops.....

BINGER, OKLAHOMA.

969A	Corn Chops.....	Binger Elevator Co.	Guarantee	9.00	3.50	3.00	70.00
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BISHOP, TEXAS.

1798A	Corn Chops.....	Bishop Manufacturing Co.	Guarantee	9.00	3.00	3.50	70.00
1798B	Kafir Chops.....		Guarantee	9.00	2.50	3.00	71.00
1798C	Mixed Chops.....		Guarantee	9.00	3.00	3.00	71.00
1798D	Milo Chops.....		Guarantee	9.50	2.50	3.00	71.00
1798D	Milo Chops.....		Found....	10.81	2.94	2.43	70.03

BLACKWELL, OKLAHOMA.

885A	Corn Chops.....	Blackwell Grain Co.	Guarantee	9.00	4.00	3.00	70.00
306A	Wheat Bran.....	Blackwell Mill and Ele- vator Co.	Guarantee	9.00	4.00	9.00	47.00
306B	Wheat Shorts.....		Guarantee	14.00	4.00	5.00	60.00
306C	Corn Chops.....		Guarantee	9.54	3.99	2.58	70.98

TEXAS AGRICULTURAL EXPERIMENT STATION.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
614A	Wheat Bran and Shorts....	Blanco Roller Mills and Gin Co.	Guarantee	17.50	3.85	8.40	55.00	.....
614B	Corn Chops.....		Guarantee	9.24	3.50	2.75	62.00	.....
BLANKET, TEXAS.									
1104A	Corn Chops.....	Oak Lewis.....	Guarantee	9.00	3.50	3.00	70.00	.....
BLEIBERVILLE, TEXAS.									
901A	Corn Chops.....	William Fick & Sons.....	Guarantee	9.00	4.00	3.00	70.00	.....
BLESSING, TEXAS.									
1181A	Corn Chops.....	Love & Colb.....	Guarantee	9.00	4.00	3.00	68.00	.....
1181B	Rice Chops.....		Guarantee	7.50	2.00	12.00	60.00	.....
1181C	Ground Oats.....		Guarantee	12.00	3.00	11.00	50.00	.....
1181D	Ground Oats and Corn....		Guarantee	10.50	3.50	7.00	65.00	.....
1181E	Mixed Rice and Corn Chops		Guarantee	8.75	2.00	6.00	65.00	.....
1181F	Chick Food.....		Guarantee	9.00	2.75	4.00	70.00	.....
1181G	L. C. Molasses Mixed Feed.		Guarantee	10.00	4.00	11.00	56.00	Rice bran, milo, molasses, corn, oats, cottonseed meal and salt.	
1181H	L. C. Mixed Cow Feed....		Guarantee	15.00	2.50	20.00	35.00	Wheat bran, cottonseed hulls, cot- tonseed meal and molasses.	
1181I	Mixed Feed.....		Guarantee	9.00	2.00	4.00	56.00	Milo chops, wheat bran, oats and molasses.	
1181J	Mixed Feed.....		Guarantee	8.50	4.00	6.00	50.00	Wheat bran, milo chops, cotton- seed meal and salt.	
1181J	Mixed Feed.....	Found.....	18.83	4.09	6.17	57.12		

BLISS, OKLAHOMA.

1440A	Corn Chops.....	Miller Bros.....	Guarantee	9.00	3.50	3.00	70.00
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BLOOMING GROVE, TEXAS.

530A	Cottonseed Meal.....	Bloomng Grove Oil Co.	Guarantee	44.00	8.00	11.00	23.00
67B	Cottonseed Meal.....		Found....	43.51	7.04	10.74	24.94
530B	Cottonseed Cake.....		Guarantee	45.00	8.00	11.00	23.00

BLOSSOM, TEXAS.

264A	Cottonseed Meal.....	Blossom Oil and Cotton Co.	Guarantee	44.00	7.00	11.00	22.00
72Y	Cottonseed Meal.....		Found....	43.88	7.41	9.71	26.86
264B	Cottonseed Meal.....		Guarantee	43.00	7.00	12.00	23.00
264B	Cottonseed Meal and Hulls.....		Found....	41.73	6.26	11.06	27.25

BLUE JACKET, OKLAHOMA.

1603A	Corn Chops.....	Blue Jacket Grain Co.....	Guarantee	9.00	3.50	3.00	70.00
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BLUFDALE, TEXAS.

1345A	Corn Chops.....	Raiza & Son.....	Guarantee	9.00	3.50	3.50	70.00
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BLUM, TEXAS.

246A	Corn Chops.....	Blum Roller Mills.....	Guarantee	9.00	3.50	3.00	70.00
246B	Wheat Bran.....		Guarantee	15.00	4.00	11.00	50.00
246C	Corn Bran.....		Guarantee	8.00	3.00	12.00	50.00
246D	Corn Feed Meal.....		Guarantee	8.25	3.50	3.50	65.00

BLUM, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
246E	Wheat Mixed Feed.....	Blum Roller Mills—Cont. {	Guarantee	16.00	3.60	8.00	55.00	Wheat bran and shorts.....	
246E	Wheat Mixed Feed.....		Found....	18.54	3.77	7.40	54.14		
1124A	Corn Chops.....	Robert Vodder.....	Guarantee	9.00	3.50	3.00	70.00		

BOERNE, TEXAS.

486A	Corn Chops.....	Albert Kutzer.....	Guarantee	9.00	4.50	3.00	71.00		
746A	Corn Chops.....	Chas. Reinhard.....	Guarantee	8.50	3.50	2.56	70.00		

BONHAM, TEXAS.

538A	Cottonseed Meal.....	Planters Cotton Oil Co.....	Guarantee	45.00	6.00	11.00	24.00		Adulterated hulls.
116Y	Cottonseed Meal.....		Found....	38.54	7.61	13.17	26.59		Adulterated hulls.
75Y	Cottonseed Meal.....		Found....	39.17	6.90	12.94	26.59		
538B	Planco Mixed Feed.....		Guarantee	10.50	2.60	43.00	30.00	Cottonseed meal and hulls.....	
538C	Cottonseed Cake.....		Guarantee	45.00	6.00	11.00	24.00		
74Y	Cottonseed Cake.....		Found....	34.15	5.92	16.97	28.46		
117Y	Cottonseed Cake.....		Found....	34.88	6.90	16.44	27.33		
538D	Cottonseed Meal and Hulls		Guarantee	35.00	6.00	15.00	24.00		Adulterated hulls.
538E	Cottonseed Meal and Hulls		Found....	41.63	9.44	9.95	24.26		
538F	Cottonseed Cake and Hulls		Guarantee	35.00	6.00	15.00	24.00		
538E	Cottonseed Cake and Hulls		Found....	38.79	8.08	12.24	26.26		
187A	Corn Chops.....	Chas. Reinhard.....	Guarantee	9.00	4.00	3.00	70.00		
187B	Wheat Bran.....		Guarantee	14.50	3.50	10.00	55.00		

187C	Mixed Feed.....	Guarantee	13.00	4.00	10.00	55.00	Wheat bran and corn bran.....
187D	Wheat Shorts.....	Guarantee	14.50	3.50	3.50	60.00	Wheat bran, corn bran and wheat screenings.
187E	Mixed Feed.....	Guarantee	13.00	4.00	10.00	55.00	
187F	Wheat Bran and Screenings	Guarantee	14.50	3.50	10.00	55.00	
187G	Milo Chops.....	Guarantee	10.00	2.50	3.00	71.00	
187G	Milo Chops.....	Found.....	10.00	3.01	2.16	71.81	
187H	Milo Chops and Wheat Bran	Guarantee	12.50	3.00	6.00	62.50	
187H	Milo Chops and Wheat Bran	Found.....	12.68	3.31	4.46	65.80	

Steger Milling Co.

BOOTH, TEXAS.

1847A	Booth's Stock Feed.....	F. I. Booth.....	Guarantee	9.00	1.00	30.00	30.00	Cane syrup, alfalfa meal, ground hay, oats, salt and charcoal
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BOWIE, TEXAS.

1455A	Corn Chops.....	Garlington Grocery Co.....	Guarantee	9.00	4.00	3.00	70.00	
1455B	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50	
915A	Corn Chops.....	C. R. Morgan.....	Guarantee	9.00	4.00	3.00	70.00	
915B	Mixed Chops.....		Guarantee	9.00	3.50	3.00	70.00	Corn and kafir chops.....
915C	Mixed Chops.....		Guarantee	9.50	2.50	3.00	70.00	Corn and cane seed chops.....
915D	Mixed Feed.....		Guarantee	10.00	2.60	3.25	68.00	Milo chops and corn bran.....
325A	Cottonseed Meal.....		Guarantee	44.00	7.00	11.00	24.00	
6P	Cottonseed Meal.....		Found.....	45.88	6.38	10.56	24.97	
325B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	24.00	
5P	Cottonseed Cake.....	Bowie Cotton Oil and Gin Co.	Found.....	42.32	7.33	11.91	25.93	
325C	Cottonseed Meal and Hulls		Guarantee	41.00	8.00	10.00	24.00	
325D	Cottonseed Cake and Hulls		Guarantee	41.00	8.00	10.00	24.00	
54P	Cottonseed Cake and Hulls		Found.....	39.94	6.14	14.20	27.93	

Adulterated hulls.

Excess hulls.

BOYD, TEXAS.

1216A	Corn Chops.....	Henry Jackson.....	Guarantee	9.00	3.50	3.00	70.00	
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BOVINA, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitrogen Extract.	Ingredients.	Remarks.
991A	Corn Chops.....	Bovina Mercantile Co.....	Guarantee	9.00	3.50	3.00	70.00	.....	.....

BRADY, TEXAS.

1047A	Cottonseed Meal.....	Bencini Cotton Oil Mill....	Guarantee	44.00	7.00	11.00	22.00	.....	.....
1047B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	22.00	.....	.....
1047C	Mixed Cottonseed Meal and Hulls.		Guarantee	11.00	2.50	37.00	35.00	.....	.....
1047D	Cottonseed Meal and Hulls		Guarantee	42.00	6.00	12.00	22.00	.....	.....
1047E	Cottonseed Meal and Hulls		Found....	46.91	7.61	8.38	23.53	.....	.....
1047E	Cottonseed Cake and Hulls		Guarantee	42.00	6.00	12.00	22.00	.....	.....
1047E	Cottonseed Cake and Hulls	Brady Cotton Oil Co.....	Found....	46.88	7.16	8.47	23.10	.....	.....
1074A	Cottonseed Meal.....		Guarantee	44.00	7.00	11.00	22.00	.....	.....
15R	Cottonseed Meal.....		Found....	45.75	7.22	10.10	24.75	.....	.....
1074B	Cottonseed Cake.....	Brazoria Grain Co.....	Guarantee	9.50	3.50	3.00	70.00	.....	.....
2101A	Corn Chops.....		Found....	9.63	3.99	2.11	71.96	.....	.....

BRAZORIA, TEXAS.

2101A	Corn Chops.....	Brazoria Grain Co.....	Guarantee	9.50	3.50	3.00	70.00	.....	.....
2101A	Corn Chops.....	Brazoria Grain Co.....	Found....	9.63	3.99	2.11	71.96	.....	.....

BRECKENRIDGE, TEXAS.

759A	Wheat Bran.....	Breckenridge Milling and Gin Co.	Guarantee	14.50	3.50	10.00	50.00	.....	.....
759B	Wheat Chops.....		Guarantee	16.00	1.75	3.50	67.00	.....	.....

BRENHAM, TEXAS.

1957A	Mixed Feed.....	Guarantee	10.00	2.00	10.00	50.00	Alfalfa meal, wheat bran, molasses, corn and milo chops.
1957B	Mixed Feed.....	Guarantee	10.00	2.00	15.00	45.00	Wheat bran, molasses, alfalfa meal and salt.
1957C	Mixed Feed.....	Guarantee	14.00	2.00	25.00	44.00	Cottonseed meal and hulls, alfalfa meal, blackstrap molasses, wheat bran and salt.
1957C	Mixed Feed.....	Found....	13.86	1.12	19.25	47.05	.....
1957D	Milo Chops.....	Guarantee	10.00	2.50	3.00	71.00	.....
1957D	Milo Chops.....	Found....	11.69	2.44	1.87	74.35	.....
1957E	Corn Chops.....	Guarantee	9.50	3.50	3.00	70.00	.....
1957E	Corn Chops.....	Found....	10.25	3.63	2.32	71.14	.....
1957F	Mixed Feed.....	Guarantee	12.00	2.50	14.00	52.00	Ear corn chops, alfalfa meal, milo head chops, rice bran, blackstrap molasses and salt.
1957F	Mixed Feed.....	Found....	10.47	3.05	12.90	52.70	.....
1957G	Hustler Cow Feed.....	Guarantee	17.60	7.10	7.90	49.00	Corn, milo and cottonseed meal and rice bran.
1957G	Hustler Cow Feed.....	Found....	18.21	8.07	9.38	47.25	.....
1957H	Mixed Feed.....	Guarantee	11.25	2.75	4.50	66.75	Milo chops and wheat bran.
1957H	Mixed Feed.....	Found....	10.48	2.78	3.22	69.59	.....
1957I	Mixed Chops.....	Guarantee	9.75	3.00	3.00	70.00	Milo and corn chops.
1957I	Mixed Chops.....	Found....	10.69	3.39	2.28	70.03	.....
1957J	Mixed Feed.....	Guarantee	9.25	3.50	13.50	62.00	Milo head chops, peanut hay meal and blackstrap molasses.
1957J	Mixed Feed.....	Found....	9.50	2.01	11.86	60.88	.....
1957K	Milo Special Mixed Feed.....	Guarantee	8.50	2.05	5.25	56.25	Milo head chops and blackstrap molasses.
1957K	Milo Special Mixed Feed.....	Found....	9.00	2.11	6.71	64.97	.....
1957L	Mixed Feed.....	Guarantee	9.50	4.00	11.50	53.50	Corn chops, milo head chops, rice bran, alfalfa meal, molasses and salt.
1957L	Mixed Feed.....	Found....	10.00	3.79	11.56	54.07	.....
255A	Corn Chops.....	Guarantee	9.00	3.00	3.00	70.00	.....

Becker & Co.....

Brenham Bottling Works.....

Adulterated hulls.

BRENHAM, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Extract.	Ingredients.	Remarks.
426A 38Y	Cottonseed Meal.....	Brenham Compress Oil and Manufacturing Co.	Guarantee	44.00	7.00	11.00	22.00	.....
	Cottonseed Meal.....		Found.....	48.50	7.74	7.33	24.09	.....
2009A	Corn Chops.....	Wm. Seidel.....	Guarantee	9.00	3.50	3.00	70.00	.....
2009A	Corn Chops.....		Found.....	11.32	4.09	2.41	69.11	.....
154A	Corn Chops.....	Zeiss Brothers.....	Guarantee	9.00	3.25	3.00	68.00	.....

BRIDGEPORT, TEXAS.

1612A	Corn Chops.....	W. S. W. Renshaw.....	Guarantee	9.00	3.50	3.00	70.00	.....
1612B	Mixed Feed.....		Guarantee	12.75	6.50	10.50	55.00	Milo heads and ground cottonseed.	
1612C	Ground Milo Heads.....		Guarantee	9.50	2.25	7.50	65.00	.....

BROWNFIELD, TEXAS.

929A	Corn Chops.....	Hamilton & Groves.....	Guarantee	9.00	4.00	3.00	70.00	.....
1532A	Corn Chops.....	M. B. Sawyer.....	Guarantee	9.00	3.00	3.00	70.00	.....
1518A	Corn Chops.....	Terry County Mill and Feed Co.	Guarantee	9.00	3.50	3.00	70.00	.....

BROWNSVILLE, TEXAS.

1671A	Corn Chops.....	M. Beasteiro.....	Guarantee	9.00	3.50	3.00	70.00	
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		Guarantee	15.00	7.00	13.50	45.00	Cold pressed cottonseed, rice bran, wheat bran and molasses.	
1572A	Armadillo Dairy Feed.....	Guarantee	9.50	8.50	8.00	50.00	Rice bran and molasses.	
1572D	Armadillo Rice Strap.....	Guarantee	9.80	4.09	2.60	72.78		
1572E	Corn Chops.....	Guarantee	16.50	4.00	4.50	60.00		
1572F	Wheat Shorts.....	Found.....	14.50	1.85	1.39	68.71		
1572G	Double Dollar Stock Feed..	Guarantee	13.50	4.50	5.50	61.50	Wheat bran and kafir meal.	
1572H	Double Dollar Stock Feed..	Found.....	14.31	8.71	4.90	62.64		
1572I	Wheat Bran.....	Guarantee	16.00	4.00	9.00	53.00		
1572J	Wheat Bran.....	Found.....	17.00	3.93	8.51	52.99		
1572K	Kafir Meal.....	Guarantee	10.00	3.00	3.00	67.00		
1572L	Kafir Meal.....	Found.....	13.35	3.50	2.19	68.45		
1404A	Rice Bran and Molasses....	Guarantee	8.00	6.50	7.25	50.00		
34T	Rice Bran and Molasses....	Found.....	9.13	6.38	12.94	42.78		
88T	Rice Bran and Molasses....	Found.....	9.62	6.79	8.56	45.77		
1404B	Wheat Bran and Molasses....	Guarantee	11.00	2.00	4.00	55.00		

Adul. rice hulls.

BROWNWOOD, TEXAS.

		Guarantee	9.25	3.90	2.50	70.00	
231A	Corn Chops.....	Guarantee	16.00	3.75	8.50	55.00	
231B	Wheat Bran.....	Guarantee	14.00	3.60	6.25	61.00	
231C	Kafir and Wheat Bran.....	Guarantee	17.00	3.50	26.00	37.25	Alfalfa meal, cottonseed meal and hulls, and wheat bran.
231E	Dairy Feed.....	Guarantee	9.25	3.90	2.50	70.00	Corn and milo chops.
231F	Mixed Chops.....	Guarantee	12.00	3.40	8.00	60.00	
231G	Mixed Feed.....	Guarantee	16.50	3.00	4.00	62.00	
231H	Wheat Shorts.....	Guarantee	14.00	4.50	8.00	52.00	
231I	Mixed Bran.....	Guarantee	9.00	3.50	3.00	70.00	
231J	Milo Chops.....	Guarantee	44.00	7.00	11.00	22.00	
310A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	22.00	
310B	Cottonseed Cake.....	Guarantee	42.00	6.00	12.00	23.00	
310C	Cottonseed Meal and Hulls	Found.....	48.50	7.74	8.61	22.00	
54W	Cottonseed Meal and Hulls	Found.....	47.41	7.47	8.68	23.79	
310D	Cottonseed Cake and Hulls	Guarantee	42.00	6.00	12.00	23.00	
310E	Cottonseed Cake and Hulls	Found.....	42.19	6.73	13.10	25.13	
55W	Cottonseed Cake and Hulls	Found.....	47.41	7.40	8.24	23.95	

Austin Mill and Grain Co.

Bencini Cotton Oil Mills..

BROWNWOOD, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
2189A	Corn Chops.....	Midgit Marvel Mill.....	Guarantee	9.00	3.50	3.00	70.00	.....
2189A	Corn Chops.....		Found....	11.31	4.12	2.38	70.93	.....
2189B	Wheat Bran.....		Guarantee	15.50	3.50	9.00	55.00	.....
2189B	Wheat Bran.....		Found....	17.34	4.07	6.89	56.98	.....
812A	Corn Chops.....	McCully & Co.....	Guarantee	9.00	4.00	3.00	70.00	.....
812B	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50	.....

BRUCEVILLE, TEXAS.

1287A	Cottonseed Meal.....	Bruceville Cotton Oil Co....	Guarantee	44.00	7.00	11.00	22.00	.....
1576A	Cottonseed Meal.....	Independent Cotton Oil Co. {	Guarantee	44.00	7.00	11.00	23.00	.....
1576B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	23.00	.....
2076A	Cottonseed Cake.....	S. C. Williams Cotton Oil Co.	Guarantee	44.00	7.00	11.00	23.00	.....
2076A	Cottonseed Cake.....		Found....	46.85	5.95	9.80	23.59	.....
2076B	Cottonseed Meal and Hulls		Guarantee	41.00	7.00	12.00	23.00	.....
2076B	Cottonseed Meal and Hulls		Found....	44.50	6.35	8.83	24.29	.....

BRYAN, TEXAS.

403A	Cottonseed Meal.....		Guarantee	44.00	7.00	11.00	23.00	.....	Adulterated hulls.
19R	Cottonseed Meal.....		Found....	41.51	6.27	13.47	25.09	.....	Adulterated hulls.
28R	Cottonseed Meal.....		Found....	40.45	7.13	12.31	25.51	.....	Adulterated hulls.
29R	Cottonseed Meal.....		Found....	41.46	7.62	12.09	24.51	.....	Adulterated hulls.
30R	Cottonseed Meal.....	Bryan Cotton Oil and Fertilizer Co.	Found....	38.88	6.89	15.03	25.66	.....	Adulterated hulls.
18R	Cottonseed Meal.....		Found....	40.76	6.76	12.73	25.82	.....	Adulterated hulls.
403B	Cottonseed Meal and Hulls		Guarantee	39.00	7.00	15.00	23.00	.....	Adulterated hulls.
403B	Cottonseed Meal and Hulls		Found....	42.10	7.00	11.83	25.00	.....	Adulterated hulls.

403C	Off Cottonseed Meal and Hulls.								
103C	Off Cottonseed Meal and Hulls.								
717A	Corn Chops.								
717B	Vick Chick Mix.								
717C	Milo Chops.								
717C	Milo Chops.								

BUDA, TEXAS.

367A	Corn Bran.								
367B	Corn Chops.								

BUFFALO, TEXAS.

203A	Corn Chops.								
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BUHLER, KANSAS.

166B	Wheat Bran.								
166C	Wheat Shorts.								
166D	Corn Chops.								
166E	Wheat Mixed Feed.								

BURKBURNET, TEXAS.

117A	Corn Chops.								
280A	Corn Chops.								

BURLESON, TEXAS.

2A	Corn Chops.								
2B	Wheat Bran.								
2C	Mixed Feed.								
2C	Mixed Feed.								

BURLINGTON, KANSAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Free Extract.	Ingredients.	Remarks.
1395A	Wheat Bran.....	Excelsior Mill.....	Guarantee	16.20	3.73	8.57	54.69	.....	.....
1395B	Wheat Mixed Feed.....		Guarantee	16.57	3.83	8.42	54.68	Wheat bran and shorts.....	.....
1395C	Wheat Shorts.....		Guarantee	17.14	4.09	4.28	60.97	.....	.....
BURLINGTON, TEXAS.									
572A	Cold Pressed Cottonseed....	Texas Cooking Oil Co.....	Guarantee	26.00	6.50	26.00	28.00	.....	.....
572A	Cold Pressed Cottonseed....		Found....	22.90	9.59	26.64	28.65	.....	.....

BURNET, TEXAS.

1441A	Wheat Chops.....	Gadge-Johnson Co.....	Guarantee	14.00	2.00	5.00	60.00	.....	.....
1564B	Wheat Bran and Shorts.....	Burnet Roller Mills.....	Guarantee	14.50	3.50	10.00	52.00	.....	.....
853A	Corn Chops.....	T. W. Gibbs.....	Guarantee	9.00	4.00	3.00	70.00	.....	.....

BURTON, TEXAS.

468A	Cottonseed Meal.....	Burton Cotton Oil Co.....	Guarantee	45.00	6.00	11.00	23.00
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BYARS, OKLAHOMA.

1073A	Corn Chops.....	Foster Brothers.....	Guarantee	9.00	3.50	3.00	70.00
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BYERS, TEXAS.

1256A	Cold Pressed Cottonseed.....	Byers Cotton Oil Co.....	Guarantee	26.00	6.00	25.00	30.00
66P	Cold Pressed Cottonseed.....		Found.....	27.60	10.36	22.55	26.80	.....	.....
1313A	Corn Chops.....	W. H. Dowlin & Sons.....	Guarantee	9.00	3.50	3.00	70.00	.....	.....

1907A	Corn Chops.....	Erwin Mill and Elevator Co.	Guarantee	9.00	4.00	3.00	70.00	.....
1463A	Kafir Head Chops.....	L. C. Smyers.....	Guarantee	9.00	2.50	7.00	68.00	.....
1463B	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....
1463C	Kafir Chops.....		Guarantee	9.50	2.50	3.00	71.00	.....
1463D	Milo Chops.....		Guarantee	9.50	2.50	3.00	71.00	.....
1463E	Wheat Chops.....		Guarantee	13.00	2.00	5.00	60.00	.....

BYRON, OKLAHOMA.

1372A	Alfalfa Meal.....	Alfalfa Milling Co.	Guarantee	13.00	1.75	30.00	37.00
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CADDO, OKLAHOMA.

2073A	Corn Chops.....	Caddo Milling Co.	Guarantee	9.00	3.50	3.00	70.00
2073A	Corn Chops.....		Found.....	10.19	4.88	2.88	68.36	.....
1319A	Corn Chops.....	Katy Milling Co.	Guarantee	9.00	3.00	3.50	70.00	.....
1319B	Wheat Bran.....		Guarantee	14.50	4.00	5.50	53.50	.....
1319C	Wheat Shorts.....		Guarantee	15.00	3.50	5.00	60.00	.....

CAIRO, ILLINOIS.

1401A	Wheat Bran.....	Cairo Milling Co.	Guarantee	14.50	4.00	10.00	54.00	.....
1401B	Premium Stock Feed.....		Guarantee	10.00	3.50	13.00	60.00	Corn, alfalfa, oat offal and whole oats
1401C	Corn Chops.....		Guarantee	9.00	4.00	2.70	70.00	.....
1401D	Harvester Molasses Feed.....		Guarantee	10.00	2.00	13.50	55.00	Corn, alfalfa, oat offal, Whole oats and molasses.
1072A	Wheat Bran.....	H. L. Halliday Milling Co.	Guarantee	14.00	4.00	8.50	55.00	.....
1072B	Wheat Mixed Feed.....		Guarantee	14.50	4.00	8.00	55.00	Wheat bran and shorts.....

CALDWELL, KANSAS.

1445A	Wheat Shorts.....	Border Queen Milling Co.	Guarantee	16.75	3.90	4.50	60.00	.....
1445B	Wheat Bran.....		Guarantee	15.90	3.90	8.90	56.50	.....
1445C	Corn Chops.....		Guarantee	9.90	3.50	3.00	69.90	.....
1445D	Wheat Mixed Feed.....		Guarantee	15.00	3.75	9.00	55.00	Wheat Bran and shorts.....

COLDWELL, KANSAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Free Extract.	Ingredients.	Remarks.
329A	Corn Chops.....	Caldwell Milling Co.	Guarantee	9.76	3.50	3.00	67.52	.....
329B	Wheat Bran.....		Guarantee	15.06	3.34	10.08	52.04	.....
329C	Wheat Shorts.....		Guarantee	16.39	3.58	4.29	59.84	.....
329D	Wheat Bran and Screenings		Guarantee	15.41	2.80	7.90	58.33	.....

COLDWELL, TEXAS.

646A	Corn Chops.....	E. C. Abbott.....	Guarantee	9.00	4.00	3.00	70.00	.....
42A	Cottonseed Meal.....	Caldwell Oil Mill Co.	Guarantee	44.00	9.00	11.00	22.00	.....
39Y	Cottonseed Meal.....		Found....	47.41	9.21	6.38	24.55	.....
45R	Cottonseed Meal.....		Found....	47.16	8.78	6.58	25.29	.....

CALIFORNIA, MISSOURI.

1354A	Wheat Bran.....	Kuklman & Meyers.....	Guarantee	14.50	3.50	10.00	50.00	.....
1354B	Wheat Shorts.....		Guarantee	15.00	3.50	5.00	60.00	.....

CALVERT, TEXAS.

449A	Cottonseed Meal.....	Gibson Gin and Oil Co.	Guarantee	44.00	7.00	11.00	24.00	.....
449B	Neizo Mixed Feed.....		Guarantee	11.00	3.00	37.00	32.00	Cottonseed meal and hulls.	
449C	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	24.00	.....
449D	Neizo Mixed Feed.....		Guarantee	7.00	2.50	35.00	41.00	Cottonseed meal and hulls.	
449E	Cottonseed Meal and Hulls		Guarantee	37.00	6.00	14.00	21.00	.....
449E	Cottonseed Meal and Hulls	McIntosh & Lauderdale.....	Found....	40.25	9.53	10.44	23.55	.....
356A	Corn Chops.....		Guarantee	9.00	4.00	3.00	70.00	.....
1908A	Corn Chops.....	Peterson & Pielach.....	Guarantee	9.00	3.50	3.00	70.00	.....

CAMERON, TEXAS.

471A	Cottonseed Meal.....	Cameron Cotton Oil Co.....	Guarantee	44.00	7.00	11.00	20.00	
36B	Cottonseed Meal.....		Found.....	45.82	7.78	10.02	23.71	
471B	Economy Mixed Feed.....		Guarantee	20.00	4.50	5.00	54.00	Cottonseed meal and crushed ear corn.
471C	Perfection Mixed Feed.....		Guarantee	31.00	5.25	6.00	46.50	Cottonseed meal and crushed ear corn.

CANADIAN, TEXAS.

1482A	Kafir Chops.....	Canadian Implement Co..	Guarantee	9.50	2.75	3.00	71.00	
1482B	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	
1482C	Wheat Chops.....		Guarantee	14.00	1.90	3.25	68.00	
1482D	Milo Chops.....		Guarantee	9.50	3.00	2.50	71.00	
1956A	Corn Chops.....	Farmers Shipping Association.	Guarantee	9.00	3.50	3.00	70.00	
1956B	Kafir Chops.....		Guarantee	10.25	2.75	2.75	68.75	
1956C	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50	
1730A	Wheat Chops.....		Guarantee	12.00	2.00	2.00	71.00	
1225A	Corn Chops.....	John H. Stillwell.....	Guarantee	9.00	3.50	3.50	70.00	
1225B	Mixed Feed.....		Guarantee	10.00	3.50	8.00	60.00	Corn and speltz.
1225C	Kafir Chops.....		Guarantee	9.50	2.75	3.00	71.00	
1225D	Milo Chops.....		Guarantee	9.50	2.50	3.00	71.00	
1225E	Wheat Chops.....		Guarantee	12.00	2.00	2.00	71.00	

CANTON, KANSAS.

735A	Corn Chops.....	Canton Milling Co.....	Guarantee	9.00	4.00	3.00	70.00	
735B	Wheat Bran.....		Guarantee	14.50	3.50	10.00	50.00	
735C	Wheat Shorts.....		Guarantee	15.00	3.50	3.00	60.00	

CANYON, TEXAS.

No	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Free Extract.	Ingredients.	Remarks.
1677A	Milo Head Chops.....	W. H. Hicks.....	Guarantee	8.50	2.25	8.00	65.00	.....	.....
1677B	Kafir Chops.....		Guarantee	9.00	3.00	3.00	65.00	.....	.....
1677C	Canyon Dairy Feed.....		Guarantee	13.25	3.97	8.50	57.90	Cottonseed meal, wheat bran and milo head chops.	.....
2100A	Milo Chops.....	Kelly & Reese.....	Guarantee	10.00	2.50	3.00	71.00	.....	.....
2100A	Milo Chops.....		Found....	12.63	2.35	2.28	71.15	.....	.....
2100B	Kafir Chops.....		Guarantee	10.50	2.75	3.00	69.50	.....	.....
2100B	Kafir Chops.....	S. B. Orton.....	Found....	11.25	3.11	2.14	70.99	.....	.....
1915A	Milo and Kafir Head Chops		Guarantee	9.50	2.25	7.50	65.00	.....	.....
1915B	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50	.....	.....
2197A	Mixed Head Chops.....	S. A. Shotwell & Co.....	Guarantee	9.50	2.60	7.00	70.00	Milo and kafir head chops.	.....
2197A	Mixed Head Chops.....		Found....	9.85	2.77	6.99	70.20	.....	.....

CARBON, TEXAS.

1322A	Corn Chops.....	T. J. Morris.....	Guarantee	9.00	3.00	3.50	70.00	.....	.....
1322B	Crushed Milo Heads.....		Guarantee	8.00	2.50	7.50	66.00	.....	.....
1322C	Wheat Chops.....		Guarantee	12.00	2.00	2.00	71.00

CARLTON, TEXAS.

1176A	Corn Chops.....	F. E. Fisher.....	Guarantee	9.00	3.50	3.50	70.00
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CARMINE, TEXAS.

1760A	Cold Pressed Cottonseed.....	Carmine Cotton Oil and Manufacturing Co.	Guarantee	25.00	6.00	26.00	28.00
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CARNEGIE, OKLAHOMA.

1531A	Corn Chops.....	W. O. Appleby.....	Guarantee	9.00	3.50	3.00	70.00
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CARNEY, TEXAS.

658A	Corn Chops.....	Carney Milling Co.....	Guarantee	9.00	4.00	3.00	70.00
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CARTHAGE, TEXAS.

2031A	Cold Pressed Cottonseed ...	Carthage Cotton Oil Co. ...	Guarantee	26.00	7.00	26.00	28.00
2031A	Cold Pressed Cottonseed ...		Found.	28.83	7.01	23.61	31.93
63R	Cold Pressed Cottonseed ...		Found.	24.09	7.81	25.48	29.17
1079A	Cold Pressed Cottonseed ...	Panola Cotton Oil Co.	Guarantee	26.00	6.75	26.25	29.00
1079B	Whole Pressed Peanut Cake		Guarantee	30.46	10.87	24.49	21.84

CARTHAGE, MISSOURI.

730A	Paradise Mixed Feed	Cowgill and Hill Milling Co.	Guarantee	15.00	3.50	8.50	57.00
730B	Corn Chops.....		Guarantee	9.00	3.00	3.50	70.00
532A	Wheat Bran.....	McDaniel Milling Co.....	Guarantee	16.00	4.00	9.00	54.00
532B	Corn Chops.....		Guarantee	9.00	4.00	3.00	70.00
532C	Wheat Shorts.....		Guarantee	16.01	4.00	4.28	60.97
532E	Wheat Bran, Shorts and Screenings.		Guarantee	16.00	4.00	9.00	54.00

CELINA, TEXAS.

200A	Corn Chops.....	Celina Mill and Elevator Co.	Guarantee	9.00	3.75	3.00	60.00
77P	Corn Chops.....		Found.	10.44	4.57	2.99	69.26
200B	Wheat Bran.....		Guarantee	15.50	3.25	9.00	55.00
200C	Wheat and Corn Bran.....		Guarantee	9.00	3.75	3.00	65.00

TEXAS AGRICULTURAL EXPERIMENT STATION.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
200D	Wheat Shorts.....	Celina Mill and Elevator Co.—Continued.	Guarantee	15.00	3.00	5.00	60.00	.....
200E	Corn Chops.....		Guarantee	9.00	3.75	3.00	85.00	.....
200F	Wheat Bran and Kafir Meal		Guarantee	14.00	3.50	8.00	62.00	.....
200G	Mixed Feed.....		Guarantee	12.00	3.00	7.00	60.00	Wheat bran and kafir meal.	
200H	Kafir Chops.....		Guarantee	9.50	2.75	3.00	71.00	.....
200I	Wheat Bran and Screenings		Guarantee	15.00	3.00	10.00	50.00	.....
200J	Milo Chops.....		Guarantee	9.50	2.75	3.00	71.00	.....
200K	Celina Poultry Food.....		Guarantee	10.75	2.75	3.75	68.25	Kafir, milo and corn chops and wheat screenings.	
200L	Mixed Chops.....		Guarantee	9.50	3.00	3.00	69.00	Sorgo and kafir chops.	
200L	Mixed Chops.....		Found.....	9.69	3.33	2.26	73.48	.....
1722A	Cold Pressed Cottonseed.....	Farmers Cotton Oil Co.....	Guarantee	25.00	6.00	26.00	28.00	.....
1729A	Corn Chops.....	T. J. McAdams.....	Guarantee	9.00	3.50	3.00	65.00	.....
1729B	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50	.....
CENTER, TEXAS.									
667A	Cottonseed Meal.....	Center Cotton Oil Co.....	Guarantee	44.00	7.00	11.00	22.00	.....
667B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	22.00	.....
667C	Mixed Feed.....		Guarantee	10.60	2.85	38.75	32.80	Cottonseed meal and hulls.	
CENTER POINT, TEXAS.									
17A	Wheat Bran.....	Center Point Roller Mills..	Guarantee	17.87	4.32	8.22	56.00	.....
17B	Corn Chops.....		Guarantee	9.00	3.00	4.00	70.00	.....
CUIDAD PORFIRIO DIA, COAH, MEXICO.									
1246A	Wheat Bran.....	Cia Harinera Del Norte.....	Guarantee	14.50	3.00	10.00	52.00	.....

CHANNING, TEXAS.

		Guarantee	10.37	2.70	2.93	72.19	
419A	Kafir Chops.....	Guarantee	11.81	1.61	2.19	71.77	
419B	Wheat and Milo Chops.....	Guarantee	12.00	3.00	12.00	50.00	
419C	Wheat and Berley Chops.....	Guarantee	9.00	4.00	3.00	70.00	
419D	Corn Chops.....	Guarantee	8.94	2.81	2.09	73.52	
419E	Milo Chops.....	Guarantee	8.51	2.29	9.45	67.99	
419F	Milo Head Chops.....	Guarantee	10.00	2.50	8.50	64.00	
419G	Feterita Head Chops.....	Found....	8.53	2.40	10.07	65.85	Excess Heads.
419G	Feterita Head Chops.....	Guarantee	10.50	2.25	3.25	67.50	
603A	Milo and Wheat Chops.....	Guarantee	9.00	2.75	3.00	70.00	
603B	Milo Chops.....	Guarantee	9.00	3.50	3.50	70.00	
603C	Corn Chops.....	Guarantee	11.00	2.50	3.00	69.00	
603D	Feterita Chops.....	Found....	10.66	2.82	2.08	72.38	

CHARLESTON, MISSOURI.

		Guarantee	8.25	4.00	3.00	70.00	
665A	Corn Chops.....	Guarantee	13.10	4.75	9.20	54.50	
665B	Wheat Bran.....	Guarantee	14.47	5.32	4.61	61.62	
665C	Wheat Shorts and Middlings.....	Guarantee	13.50	4.00	9.50	54.50	Wheat and corn bran and screenings
665D	Mixed Bran and Screenings.....	Guarantee	14.50	4.60	6.00	54.50	Wheat and corn bran and screenings
665E	Mixed Feed.....	Guarantee	14.50	4.60	6.00	54.50	Wheat and corn bran and screenings

CHECOTAH, OKLAHOMA.

		Guarantee	9.00	3.50	3.00	70.00	
1134A	Corn Chops.....	Checotah Mill and Elevator Co.	8.50	3.50	3.50	71.00	
688A	Corn Chops.....	Lawrence Grain and Milling Co.	8.50	3.50	3.50	71.00	

CHEROKEE, OKLAHOMA.

709A	Max-Flora.....	Alfalfa Meal and Milling Co.	12.21	2.95	10.72	57.58	
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CHEROKEE, KANSAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Free Extract.	Ingredients.	Remarks.
1149A	Corn Cnops.....	Cherokee Mill and Elevator Co.	Guarantee	9.00	3.50	3.50	70.00		

CHERRYVILLE, KANSAS.

386A	Wheat Bran.....	N. Sauer Milling Co.....	Guarantee	15.00	3.95	11.65	53.10		
386B	Wheat Shorts.....		Guarantee	18.12	4.81	6.46	56.70		

CHESTER, ILLINOIS.

686B	Wheat Shorts.....	H. C. Cole Milling Co.....	Guarantee	16.00	4.50	4.00	57.00		
686C	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00		
686D	Wheat Middlings.....		Guarantee	15.00	4.50	8.00	57.00		
686A	Wheat Bran.....		Guarantee	14.50	4.00	10.00	52.00		
686E	Wheat Bran with Ground Screenings.		Guarantee	14.50	4.00	9.50	52.00		
686E	Wheat Bran with Ground Screenings.		Found....	16.04	3.69	8.45	54.04		
686F	Wheat Middlings with Ground Screenings.		Guarantee	15.00	4.00	4.00	57.00		
686F	Wheat Middlings with Ground Screenings.		Found....	15.13	3.43	4.36	63.45		

CHICAGO, ILLINOIS.

2023A	Blue Ribbon Meat Meal.....	Cudahy Packing Co.....	Guarantee	60.00	10.00	1.75			
2023A	Blue Ribbon Meat Meal....		Found....	64.04	8.52	2.62	3.36		
361A	Beef Scraps.....		Guarantee	55.00	10.00				
361B	Darling 40 pr. ct. Protein Digestive Tankage.		Guarantee	40.00	.50	3.00			

361B	Darling 40 pr. ct. Protein Digestive Tankage.	Found.....	43.38	1.34	5.81	5.08	
361C	Darling's Bone Chops.....	Guarantee	20.00	.50	3.00		
361C	Darling's Bone Chops.....	Found.....	26.13	2.42	2.56	.35	
361D	Darling's High Protein Meat Scraps.	Guarantee	55.00	.50	3.00		
361D	Darling's High Protein Meat Scraps.	Found.....	60.75	7.81	3.34	.79	
361E	Darling's Meat Crisps.....	Guarantee	75.00	.50	3.00		
361E	Darling's Meat Crisps.....	Found.....	80.38	6.91	1.76		
361F	Darling's Standard Meat Scraps.	Guarantee	45.00	.50	3.00		
361F	Darling's Standard Meat Scraps.	Found.....	49.98	6.48	5.55	1.76	
361G	Darling's Blood Meal.....	Guarantee	85.00	.50	3.00		
361G	Darling's Blood Meal.....	Found.....	86.88	.33	.97	1.24	
361H	Darling's 60 pr. ct. Protein Digestive Tankage.	Guarantee	85.00	.50	3.00		
361H	Darling's 60 pr. ct. Protein Digestive Tankage.	Found.....	85.44	5.82	1.63	.91	
1775A	Kingfalfa Horse Feed.....	Guarantee	9.00	2.00	15.00	55.00	Corn, oats, alfalfa and molasses
1775B	Kingfalfa Meadow Feed.....	Guarantee	10.00	5.00	26.00	40.00	Alfalfa and molasses
1541A	Sulzberger's High Protein Tankage.	Guarantee	60.00	8.00	1.00		
1379A	Banner Feed.....	Guarantee.	9.75	3.75	10.50	62.00	Ground corn, flax screenings, whole crushed oats, cottonseed meal, wheat flour, oat meal mill by-products (oat middlings, oat hulls and oat shorts) and salt.
1379B	Schumacher Stock Feed.....	Guarantee	10.00	3.25	10.00	62.00	Barley corn, wheat flour, cottonseed meal, oat meal mill by-products (oat middlings, hulls and shorts) and salt.
1379C	Quaker Molasses Dairy Feed	Guarantee	16.00	3.50	14.00	50.00	Molasses, malt sprouts, cottonseed meal, ground grains screenings and clipped oat by-products.

CHICAGO, ILLINOIS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
1379D	Schumacher Special Horse Feed.	Quaker Oats Co.—Continued.....	Guarantee	9.25	3.25	8.00	64.50	Corn, oats, oat meal by-products (oat middlings, hulls, shorts) and salt.	
1379F	Sterling's Scratch Feed.....		Guarantee	10.00	2.50	5.00	60.00	Whole wheat, kafir, barley, cracked corn, whole buckwheat and sunflower seed.	
1379G	Excelsior Feed.....		Guarantee	8.00	3.00	12.00	62.00	Ground corn, hominy feed, oat meal by-products (oat middlings, hulls and shorts) and salt.	
1379H	Milofalfa Feed.....		Guarantee	10.00	3.50	12.00	58.00	Ground corn, alfalfa meal, whole oats, barley, ground flax seed, cottonseed meal, oat meal mill by-products (oat middlings, hulls and shorts) and salt.	
1379I	Victor Feed.....		Guarantee	8.00	3.00	12.00	62.00	Ground corn, hominy feed, oat meal mill by-products (oat middlings, hulls and shorts) and salt.	
1379J	Cracker Mule Feed.....		Guarantee	10.00	3.50	12.00	58.00	Ground corn, flax screenings, alfalfa meal, whole barley, oats, cottonseed meal, oat meal mill by-products (oat middlings, hulls, and shorts) and salt.	
1379K	Green Cross Horse Feed....		Guarantee	10.00	2.50	12.00	62.00	Alfalfa meal, ground corn, whole oats, cottonseed meal, molasses, oat meal mill mill by-products (oat middlings, hulls and shorts)	
1379L	Sterling Horse Feed.....		Guarantee	9.25	3.25	8.00	64.50	Ground corn, whole oats, oat meal mill by-products (oat middlings, hulls and shorts) and salt.	
1379M	Sterling Stock Feed.....		Guarantee	10.00	3.25	10.00	62.00	Ground corn, barley, and hominy, feed, wheat flour, middlings, cot-	

1379N	Sweet Green Horse Feed...	Guarantee	10.00	2.50	12.00	62.00	tonseed meal, oat meal mill by-products (oat middlings, hulls and shorts), ground puffed wheat and rice and salt.
1379O	Mogul Molasses Mixed Feed	Guarantee	10.00	3.00	15.00	50.00	Alfalfa meal, ground corn, oats, cottonseed meal, molasses, oat meal mill by-products (oat middlings, hulls and shorts).
1379R	Quaker Scratch Grains.....	Guarantee	10.00	2.50	5.00	60.00	Molasses, crushed oats, cracked corn, alfalfa meal, ground grain screenings, oat meal mill by-products (oat middlings, hulls, and shorts).
1379U	Golden Sweet Mule Feed...	Guarantee	8.00	2.00	15.00	58.00	Whole wheat, kafir, barley, cracked corn, whole buckwheat and sunflower seed.
1379V	Quaker Poultry Mash.....	Guarantee	17.50	4.00	10.00	52.00	Cottonseed meal, alfalfa meal, ground corn, molasses, oat meal mill by-products (oat middlings, hulls and shorts).
1379W	Stayrite Mixed Feed.....	Guarantee	10.00	3.30	16.00	54.00	Meat scraps, oat meal, wheat bran, alfalfa meal, yellow hominy feed, corn gluten meal and ground grain screenings.
1379X	Blue Ribbon Mixed Feed...	Guarantee	9.75	3.75	10.50	62.00	Cracked corn, alfalfa meal, cottonseed meal, oat meal mill by-products (oat middlings, hulls and shorts).
1379X	Blue Ribbon Mixed Feed...	Found.	10.09	3.48	10.07	62.93	Ground corn, crushed oats, cottonseed meal, wheat flour, ground flax screenings, oat meal mill by-products (oat middlings, hulls and shorts and salt.

CHICKASHA, OKLAHOMA.

1189A	Cottonseed Meal.....	Guarantee	44.00	8.00	11.00	22.00	Apache Cotton Oil and Manufacturing Co.
1189B	Cottonseed Cake.....	Guarantee	44.00	8.00	11.00	22.00	

CHICKASHA, OKLAHOMA—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
1301A	Cottonseed Cake.	Chickasha Cotton Oil Co.	Guarantee	44.00	7.00	11.00	23.00		Adulterated hulls. Adulterated hulls.
52P	Cottonseed Cake.		Found	35.82	5.26	16.90	28.52		
53P	Cottonseed Cake.		Found	43.60	6.36	11.86	25.05		
1301B	Cottonseed Hulls and Meal.		Guarantee	15.00	2.00	45.00	26.00		
1301C	Cottonseed Meal.		Guarantee	44.00	7.00	11.00	23.00		
188A	Corn Chops.		Guarantee	10.00	3.50	3.50	70.00		
188B	Wheat Bran.		Guarantee	14.30	4.49	8.65	56.78		
188D	Wheat Bran and Screenings		Guarantee	16.20	3.75	8.57	54.69		
188C	Wheat Shorts.		Guarantee	17.64	4.00	5.00	57.36		
188E	Wheat Mixed Feed and Screenings.	Chickasha Milling Co.	Guarantee	17.00	4.00	8.57	54.69	Wheat bran, shorts and screenings.	
68P	Wheat Mixed Feed and Screenings.		Found	18.63	3.94	8.87	52.44		
188F	Kafir Chops.		Guarantee	10.50	2.75	3.00	69.50		
188F	Kafir Chops.		Found	12.66	3.39	2.76	69.14		
661A	Corn Chops.	Linton Grain Co.	Guarantee	9.54	4.00	2.56	70.99		
1133A	Corn Chops.	Moore Grain Co.	Guarantee	9.00	3.50	3.50	70.00		

CHIHUAHUA, MEXICO.

1904A	Wheat Bran.	V. de la Garza	Guarantee	14.50	4.20	9.50	55.00		
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CHILDRESS, TEXAS.

1909A	Corn Chops.	Huggins-Andrews Co.	Guarantee	9.00	3.50	3.00	70.00		
1909B	Milo Chops.		Guarantee	10.00	2.50	3.00	70.50		

307A	Corn Chops.....	John R. Scott.....	Guarantee	9.41	3.72	2.30	73.22
307B	Milo Chops.....		Guarantee	9.50	3.00	3.00	71.00
307D	Wheat Chops.....		Guarantee	14.00	2.00	4.00	65.00
307D	Wheat Chops.....		Found....	18.87	2.12	3.89	62.90

CHILLICOTHE, TEXAS.

989A	Corn Chops.....	Orient Milling Co.....	Guarantee	9.25	3.50	3.00	70.00
989B	Wheat Shorts.....		Guarantee	16.00	3.60	5.00	70.00
989C	Wheat Bran.....		Guarantee	15.00	3.50	10.00	50.00
989D	Mixed Feed.....		Guarantee	12.50	3.00	5.50	65.00
989E	Kafir Chops.....		Guarantee	9.25	2.50	3.00	71.00
989F	Mixed Feed.....		Guarantee	9.25	2.50	3.00	71.00
989G	Milo Chops.....		Guarantee	9.50	2.50	3.00	71.00
989H	Mixed Feed.....		Guarantee	12.50	3.00	5.50	65.00
989I	Sorge Chops.....		Guarantee	8.02	2.14	2.62	72.63
989J	Mixed Bran.....		Guarantee	14.50	3.75	9.25	55.25
989K	Wheat Bran and Screenings	L. T. Randel.....	Guarantee	15.00	3.50	10.00	50.00
989L	Corn Chops and Corn Bran		Guarantee	9.00	3.50	3.00	70.00
989M	Wes-Tex Poultry Feed.....		Guarantee	11.00	2.75	3.75	68.00
989M	Wes-Tex Poultry Feed.....		Found....	10.59	2.93	3.38	69.54
1856A	Feterita Chops.....		Guarantee	9.00	2.50	3.50	71.00
1856B	Chicken Feed.....		Guarantee	9.00	3.50	3.00	70.00

CHINO, CALIFORNIA.

1721A	Abasco Steam Dried Beet Pulp..	American Beet Sugar Co.....	Guarantee	8.00	.50	20.00	58.00
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CISCO, TEXAS.

470A	Cottonseed Meal.....	Cisco Oil Mill.....	Guarantee	44.00	7.00	11.00	22.00
20W	Cottonseed Meal.....		Found....	44.38	7.09	10.20	24.93
63W	Cottonseed Meal.....		Found....	42.38	7.26	11.51	25.95
2W	Cottonseed Meal.....		Found....	41.90	6.02	12.43	26.75
77W	Cottonseed Meal.....		Found....	42.32	7.59	11.32	27.30
470C	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	22.00

Adulterated hulls.
Adulterated hulls.
Adulterated hulls.

CISCO, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen- Free Extract.	Ingredients.	Remarks.
19W	Cottonseed Cake.....	Cisco Oil Mill—Cont'd....	Found.....	43.81	6.84	10.68	25.36	.....	Adulterated hulls.
78W	Cottonseed Cake.....		Found.....	37.48	6.33	14.52	29.70		
2069A	Corn Chops.....	Wm. P. M. Willson.....	Guarantee	9.00	3.50	3.00	70.00	.....	.....
2069A	Corn Chops.....		Found.....	10.31	4.77	2.55	69.12		

CITRUS GROVE, TEXAS.

1267A	Corn Chops.....	L. G. Cobb.....	Guarantee	9.00	4.00	3.00	68.00
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CLAFLIN, KANSAS.

1716A	Wheat Bran.....	Clafin Mill and Elevator Co.	Guarantee	14.50	3.50	10.00	50.00	Wheat bran, shorts and screenings..
1716B	Wheat Shorts.....		Guarantee	15.50	4.00	6.00	55.00		
1716D	Wheat Bran and Screenings		Guarantee	14.50	3.50	10.00	50.00		
1716E	Wheat Mixed Feed and Screenings.		Guarantee	15.00	3.50	8.00	55.00		

CLARENDON, TEXAS.

638A	Corn Chops.....	Bennett-Sims Mill and Ele- vator Co.	Guarantee	9.00	4.00	3.00	70.00
638B	Milo Chops.....		Guarantee	9.00	2.50	3.50	70.00		
638C	Kafir Chops.....		Guarantee	9.00	2.50	3.00	70.00		
638D	Milo Head Chops.....		Guarantee	8.50	2.25	8.00	65.00		
638E	Kafir Head Chops.....	Clarendon Grain Co.....	Guarantee	8.50	2.25	8.00	65.00
1794A	Corn Chops.....		Guarantee	9.00	4.00	3.00	70.00		
1794C	Kafir Chops.....		Guarantee	9.00	2.50	3.50	70.00		
1794C	Milo Head Chops.....		Guarantee	8.00	2.50	7.50	65.00		
1794D	Milo Chops.....		Guarantee	9.00	2.50	8.50	70.00		

CLARKSVILLE, TEXAS.

954A	Kafr Head Chops.....	{	John H. Clark.....	{	Guarantee	8.00	2.00	9.00	65.00	.....
954B	Kafr Chops.....		Guarantee		9.00	2.50	3.00	70.00	.....	
519A	Milo Head Chops.....	{	E. D. & J. D. McAdams..	{	Guarantee	7.50	2.50	7.00	62.00	.....
519B	Kafr Head Chops.....		Guarantee		9.00	2.50	7.00	68.00	.....	
CLARKSVILLE, TEXAS.											
223A	Cottonseed Meal.....	{	Clarksville Cotton Oil Co.	{	Guarantee	44.00	7.00	11.00	25.00	.....
70Y	Cottonseed Meal.....				Found...	40.88	9.68	10.39	25.72		.....
223B	Cottonseed Cake.....				Guarantee	44.00	7.00	11.00	25.00		.....
223C	Cottonseed Meal and Hulls				Guarantee	40.00	7.00	12.00	23.00		.....
223C	Cottonseed Meal and Hulls				Found...	40.63	8.02	9.61	28.20		.....
223D	Red River Mixed Feed.....				Guarantee	10.50	2.00	43.00	25.30		Cottonseed meal and hulls.....
69Y	Red River Mixed Feed.....				Found...	9.99	2.30	42.13	32.13		.....
223E	Cottonseed Cake and Hulls				Guarantee	40.00	7.00	12.00	23.00		.....
223E	Cottonseed Cake and Hulls				Found...	42.63	8.10	8.33	26.85		.....
Adulterated hulls.....											

Adulterated hulls.

CLAUDE, TEXAS.

450A	Milo Chops.....	Guarantee	9.00	2.75	3.00	70.00
450B	Kafr Chops.....	Guarantee	10.25	2.75	2.75	68.75
450C	Feterita Chops.....	Guarantee	12.95	2.89	2.04	69.66

Nelson & Smalley.....

CLAY CENTER, KANSAS.

1044A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00
1044A	Corn Chops.....	Found.....	11.84	4.17	2.36	67.80
1044B	Wheat Shorts.....	Guarantee	16.50	3.60	5.00	60.00
1044B	Wheat Shorts.....	Found.....	17.94	4.42	5.91	57.56
1044C	Wheat Bran and Scourings.....	Guarantee	14.50	3.50	10.00	55.00
1044C	Wheat Bran and Scourings.....	Found.....	16.66	3.78	9.98	52.77
538A	Corn Chops.....	Guarantee	9.00	3.00	3.00	70.00
538B	Wheat Bran.....	Guarantee	15.50	3.50	10.00	52.50
538C	Wheat Shorts.....	Guarantee	17.00	4.00	5.00	59.00
538D	Wheat Mixed Feed.....	Guarantee	16.50	3.50	8.00	53.00

Williamson Milling Co.

Wheat bran and shorts.

CLEBURNE, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
54A	Corn Chops.	Anderson Bros. Roller Mills.	Guarantee	9.80	4.90	2.90	71.14	.....	.....
54B	Mixed Bran.		Guarantee	15.00	4.50	8.40	54.00	Corn and wheat bran.	.....
54C	Mixed Bran and Screenings		Guarantee	15.00	4.50	8.40	54.00	Corn and wheat bran and ground screenings.	.....
54D	Milo Chops.		Guarantee	10.00	2.60	3.00	68.00	.....	.....
54E	Milo Chops.		Found	10.02	2.70	1.96	71.28	.....	.....
914A	L. C. Cason Hen Feed.	L. C. Cason.	Guarantee	10.00	2.50	3.60	70.00	Milo, kafir, wheat, peanuts and corn chaff.	.....
914B	Baby Chick Feed.		Guarantee	10.00	3.00	5.00	65.00	Milo, and corn chops, millet seed and wheat screenings.	.....
914B	Baby Chick Feed.		Found	11.50	3.14	3.78	68.21	.....	.....
350A	Corn Chops.	Cleburne Grain and Seed Co.	Guarantee	9.50	3.50	3.00	70.00	.....	.....
350B	Milo Chops.		Guarantee	10.00	2.50	3.00	71.00	.....	.....
350C	Kafir and Milo Chops.		Guarantee	9.00	2.75	3.00	69.00	.....	.....
350D	Mixed Chops.		Guarantee	10.00	3.50	3.00	60.00	Kafir, milo, feterita and millet chops.	.....
350D	Mixed Chops.		Found	11.06	2.88	2.31	70.63	.....	.....
350E	Poultry Feed.	.....	Guarantee	10.00	3.00	4.50	67.00	Corn, milo, feterita and kafir chops.	.....
350E	Poultry Feed.		Found	10.13	2.84	3.29	70.73	African and German millet.	.....
350E	Poultry Feed.		.....	.....	.....	.....	.....	.....	.....
132A	Prime Cottonseed Meal.	Cleburne Oil Mill Co.	Guarantee	44.00	8.00	11.00	22.00	.....	Adulterated hulls.
29B	Prime Cottonseed Meal.		Found	42.20	6.80	12.50	24.90	.....	.....
132B	Cottonseed Cake.		Guarantee	44.00	8.00	11.00	22.00	.....	.....
132C	Cleburne Cattle Feed.		Guarantee	10.50	2.00	43.00	30.00	Cottonseed meal and hulls.	.....
30B	Cleburne Cattle Feed.		Found	10.94	1.69	40.76	33.43	.....	.....
132D	Choice Cottonseed Meal.	.....	Guarantee	47.00	8.00	9.00	22.00	.....	.....
132E	Cottonseed Meal and Hulls		Guarantee	42.00	6.60	13.00	23.00	.....	.....
432E	Cottonseed Meal and Hulls		Found	39.81	7.18	12.09	27.00	.....	.....

Sample No.	Sample Name	Guarantee	16.00	3.00	42.42	24.33	Peanut hulls and cottonseed meal.
1619A	Climax Mixed Feed.....	Guarantee	16.00	3.00	42.42	24.33	
1619B	Peanut Meal.....	Guarantee	45.00	7.00	9.00	22.00	
1619B	Peanut Meal.....	Found....	42.00	9.57	9.30	26.00	
1619C	Peanut Cake.....	Guarantee	45.00	7.00	9.00	22.00	
1619C	Peanut Cake.....	Found....	45.38	8.23	8.05	24.96	
198A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	
198B	Mixed Bran.....	Guarantee	14.00	4.50	9.50	51.00	Wheat and corn bran.
198C	Mixed Feed.....	Guarantee	13.80	3.53	8.16	58.60	Wheat and corn bran, wheat shorts, kafir meal and wheat screenings.
198D	Milo Chops.....	Guarantee	10.00	2.50	3.00	70.00	
198D	Milo Chops.....	Found....	10.94	2.73	2.10	71.28	
11142A	Corn Chops.....	Guarantee	9.00	3.50	3.50	70.00	
11142B	Milo Chops.....	Guarantee	10.00	2.50	3.00	71.00	
171A	Corn Chops.....	Guarantee	12.00	4.00	3.00	70.00	
171B	Mixed Feed.....	Guarantee	12.00	3.00	7.00	60.00	Wheat Bran and kafir chops.
171C	Kafir Feed.....	Guarantee	9.00	2.50	3.00	70.00	

CLIFTON, TEXAS.

Wheat Bran.....	Guarantee	15.00	3.50	9.00	54.00	.....
Wheat Bran.....	Found....	18.88	3.77	7.04	56.66	.....
Mixed Feed.....	Guarantee	14.50	3.50	9.00	55.00	Wheat and corn bran and wheat screenings.
Mixed Feed.....	Found....	15.81	3.83	6.13	60.49	.....
Corn Chops.....	Guarantee	9.50	3.00	3.00	70.00	.....
Corn Chops.....	Found....	9.87	4.07	2.14	70.89	.....
Wheat Gray Shorts.....	Guarantee	17.00	3.80	4.50	60.00	.....
Wheat Gray Shorts.....	Found....	17.88	4.35	5.19	58.79	.....
Mixed Feed.....	Guarantee	12.50	3.00	6.00	62.50	Wheat bran and milo chops.
Mixed Feed.....	Found....	13.63	3.48	5.69	63.32	.....
Milo Chops.....	Guarantee	10.00	2.50	3.00	71.00	.....
Milo Chops.....	Found....	10.09	2.69	2.03	70.91	.....
Mixed Feed.....	Guarantee	13.00	3.25	8.00	58.00	Wheat bran and milo chops.
Mixed Feed.....	Found....	16.80	3.64	7.09	58.58	.....

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen- Free Ex- tract.	Ingredients.	Remarks.
1665A	Clint Alfalfa Meal.	J. E. White.	Guarantee	13.50	2.00	30.00	38.00		
CLINTON, MISSOURI.									
301A	Corn Chops.	Bernheimer Marcus Flour Mills.	Guarantee	9.00	4.00	3.00	65.00		
301B	Wheat Bran.		Guarantee	14.50	4.00	9.50	50.00		
301C	Wheat Middling.		Guarantee	15.00	4.00	5.00	55.00		
301D	Wheat Mixed Feed.		Guarantee	14.50	4.00	8.00	55.00	Wheat bran and shorts.	
301E	B. F. Wheat Middlings.		Guarantee	16.00	4.50	4.00	60.00		
1270A	Corn Chops.	J. H. Kracke Milling Co.	Guarantee	9.00	3.00	3.50	70.00		
1120B	Corn Chops.	H. H. Hurley.	Guarantee	9.00	4.00	3.00	70.00		
CLINTON, OKLAHOMA.									
1622A	Corn Chops.	J. D. Chalfant Grain Co.	Guarantee	9.54	3.99	2.55	70.38		
1622B	Kafir Chops.		Guarantee	10.26	3.02	2.08	72.16		
1052A	Stock Feed.	Clinton Alfalfa Mills.	Guarantee	13.00	2.82	18.11	47.28	Alfalfa meal, corn chops, cottonseed meal and salt.	
1052B	Alfalfa Meal.		Guarantee	11.50	1.50	35.00	30.00		
1052C	Best Ever.		Guarantee	13.00	2.82	18.11	47.28	Alfalfa meal, corn chops, cottonseed meal and salt.	
70A	Corn Chops.	Wilbur Milttenbugar.	Guarantee	9.00	3.50	3.00	70.00		
70B	Wheat Bran.		Guarantee	14.00	3.33	10.00	48.00		
CLYDE, TEXAS.									
2143A	Corn Chops.	John Loven.	Guarantee	9.50	3.50	3.00	70.00		
2143B	Corn Chops.		Found.	11.44	3.67	2.28	69.86		

COFFEYVILLE, KANSAS.

1286A	Corn Chops.....	Kemper Grain Co.....	Guarantee	9.00	3.00	3.50	70.00	.....
1256A	Wheat Mixed Feed.....	Kiddo Milling Co.....	Guarantee	14.40	3.44	7.90	67.00	Wheat bran and shorts.....
189D	Corn Chops.....	Rea-Patterson Milling Co	Guarantee	9.00	4.00	3.00	70.00	.....
189E	Wheat Shorts and Screenings		Guarantee	16.00	3.50	5.50	61.02	.....
189F	Wheat Bran and Screenings		Guarantee	14.50	3.50	10.00	51.70	.....
189G	Wheat Mixed Feed and Screenings.		Guarantee	16.00	3.50	8.50	55.30	Wheat bran, shorts and screenings.
189H	Kafir Chops.....		Guarantee	10.00	2.50	3.00	72.00	.....
189H	Kafir Chops.....		Found.....	10.13	3.05	2.38	71.78	.....

COLEMAN, TEXAS.

2051A	Cottonseed Meal.....	Bencini Cotton Oil Mills.	Guarantee	44.00	7.00	11.00	22.00	.....
2051A	Cottonseed Meal.....		Found.....	44.45	7.67	11.06	25.45	.....
2051B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	22.00	.....
2051B	Cottonseed Cake.....		Found.....	46.06	6.93	9.94	25.17	.....
2051C	Cottonseed Meal and Hulls		Guarantee	42.00	6.00	12.00	22.00	.....
2051C	Cottonseed Meal and Hulls	Coleman Grain and Mercantile Co.	Found.....	45.57	7.46	9.56	24.74	.....
52W	Cottonseed Meal and Hulls		Found.....	44.26	6.80	10.71	25.31	.....
2051D	Cottonseed Cake and Hulls		Guarantee	42.00	6.00	12.00	22.00	.....
2051D	Cottonseed Cake and Hulls		Found.....	44.13	6.76	11.35	25.12	.....
53W	Cottonseed Cake and Hulls		Found.....	46.23	6.60	10.39	23.23	.....
1734A	Corn Chops.....	Coleman Grain and Mercantile Co.	Guarantee	9.00	3.50	3.00	70.00	.....
1734B	Milo Chops.....		Guarantee	9.00	2.50	3.50	71.00	.....
1734C	Wheat Chops.....		Guarantee	12.00	2.00	2.00	71.00	.....
1734D	Corn and Milo Chops.		Guarantee	9.00	3.00	3.25	70.00	.....
1738A	Wheat Bran and Screenings.	Coleman Milling Co.....	Guarantee	15.00	3.75	8.00	52.00	.....
2127A	Corn Chops.....	Rogers Milling Co.....	Guarantee	9.50	3.50	3.00	70.00	.....
2127A	Corn Chops.....		Found.....	9.63	4.14	2.38	70.14	.....
2127B	Corn Bran.....		Guarantee	9.00	5.00	10.00	63.00	.....
2127B	Corn Bran.....		Found.....	8.18	6.58	13.12	57.76	.....

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Free Extract.	Ingredients.	Remarks.
2127C	Wheat Bran, Shorts and Screenings.	Rogers Milling Co.—Cont.	Guarantee	16.00	3.60	8.00	55.00		
2127C	Wheat Bran, Shorts and Screenings.		Found . . .	17.43	3.49	6.19	56.90		
1009A	Corn Chops.	G. P. Roquemore.....	Guarantee	9.00	3.50	3.00	70.00		
1009B	Milo Chops.		Guarantee	9.00	2.50	3.50	71.00		
1009B	Milo Chops.		Found . . .	10.91	3.00	2.56	72.36		
COLORADO, TEXAS.									
620A	Cottonseed Meal.	Continental Oil and Cotton Co.	Guarantee	44.00	7.00	11.00	24.00		Adulterated hulls.
17W	Cottonseed Meal.		Found . . .	40.13	9.10	13.38	25.25		Adulterated hulls.
620B	Cottonseed Meal.		Guarantee	44.00	7.00	11.00	24.00		
16W	Cottonseed Cake.		Found . . .	38.48	6.86	14.72	26.92		
620C	Cottonseed Meal and Hulls		Guarantee	35.00	5.00	20.00	20.00		
620C	Cottonseed Meal and Hulls		Found . . .	39.32	8.03	13.11	27.50		
620D	Cottonseed Cake and Hulls		Guarantee	35.00	5.00	20.00	20.00		
620D	Cottonseed Cake and Hulls		Found . . .	40.00	8.12	12.29	27.95		
846A	Kafir Chops.		Guarantee	10.00	3.50	3.00	70.00		
846B	Crushed Milo Heads.		Guarantee	9.22	2.44	6.51	69.50		
846C	Corn Chops.	Scott and Lambert.....	Guarantee	9.00	3.00	3.00	70.00		
846D	Ear Corn Chops.		Guarantee	9.00	3.69	7.10	68.78		
846E	Milo Chops.		Guarantee	9.00	2.50	3.00	70.00		
68W	Milo Chops.	Found . . .	11.41	3.55	2.41	71.05			

COLUMBUS, TEXAS.

348A	Corn Chops.	George Gegenworth.	Guarantee	9.00	3.00	4.00	70.00	
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COMANCHE, TEXAS.

64A	Cottonseed Meal.....	Guarantee	44.00	6.50	11.00	22.00	
56W	Cottonseed Meal.....	Found....	44.35	9.28	9.21	24.08	
64B	Cottonseed Cake.....	Guarantee	44.00	6.50	11.00	22.00	
57W	Cottonseed Cake.....	Found....	44.92	8.10	9.06	23.63	
64C	Whole Pressed Peanut Meal	Guarantee	36.00	6.00	20.00	23.00	
64C	Whole Pressed Peanut Meal	Found....	34.84	8.60	22.77	21.05	
18W	Whole Pressed Peanut Meal	Found....	35.26	12.57	22.44	18.81	
64D	Whole Pressed Peanut Cake	Guarantee	36.00	6.00	20.00	23.00	
64D	Whole Pressed Peanut Cake	Found....	35.94	9.80	22.08	21.86	
58W	Whole Pressed Peanut Cake	Found....	35.10	9.94	21.55	20.92	
409A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	
409B	Ear Corn Chops without Shucks.	Guarantee	8.50	2.25	8.50	70.00	
409C	Mixed Feed.....	Guarantee	8.91	2.31	8.15	69.99	Corn and cob.
409D	Mixed Feed.....	Guarantee	9.50	3.75	10.00	55.00	Alfalfa and corn.
409E	Alfalfa and Corn Chops.....	Guarantee	11.00	2.50	11.00	55.00	
409F	Milo Chops.....	Guarantee	9.50	2.50	3.00	71.00	
2160A	Milo Chops.....	Guarantee	10.00	2.50	3.00	71.00	
2160A	Milo Chops.....	Found....	11.00	2.64	2.68	71.94	

COMANCHE, OKLAHOMA.

592A	Corn Chops.....	Comanche Grain and Elevator Co.	Guarantee	9.00	3.95	3.00	70.00	
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COMFORT, TEXAS.

155A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00
155B	Wheat Bran.....	Guarantee	14.50	3.50	10.00	50.00
155C	Wheat Chops.....	Guarantee	12.00	2.00	2.00	71.00
155D	Wheat Bran and Screenings	Guarantee	14.50	3.50	9.00	52.00
707C	Wheat Bran and Screenings	Found.....	16.86	3.46	7.37	56.12
1784A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00

Comfort Roller Mills.

D. Holekamp & Son.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen- Ex- tract.	Ingredients.	Remarks.
150A 107Y	Cottonseed Meal. Cottonseed Meal.	Commerce Oil Mill.	Guarantee Found.	44.00 43.19	7.00 7.97	11.00 10.71	25.00 25.47	Adulterated hulls.	
79A 79B 79C	Corn Chops. Wheat Shorts. Wheat Bran, Shorts, Screen- ings and Corn Bran.	Greenville Mill and Ele- vator Co.	Guarantee Guarantee Guarantee	9.00 15.00 14.50	4.00 3.00 4.00	3.00 2.00 9.00	70.00 68.00 54.00		
79D 79E	Mixed Chops. Milo Chops.		Guarantee Guarantee	9.50 10.00	3.00 2.50	3.00 3.00	70.25 70.50	Corn and milo chops.	
1704A	Wheat Bran.	L. B. Thornton.	Guarantee	14.50	3.00	10.00	55.00		

CONROE, TEXAS.

2113A 2113A 2113B 2113B	Corn Chops. Corn Chops. Milo Chops. Milo Chops.	J. W. Baker.	Guarantee Found. Guarantee Found.	9.50 9.88 10.00 10.31	3.50 2.23 2.50 2.67	3.00 3.98 3.00 2.01	70.00 69.19 71.00 71.34		
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CONWAY SPRINGS, KANSAS.

1381A 1381B	Wheat Mixed Feed. Wheat Bran.	B. Strong Grain and Coal Co.	Guarantee Guarantee	15.00 14.00	3.25 3.00	8.50 8.00	55.00 50.00	Wheat bran and shorts.	
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COOLIDGE, TEXAS.

1208A 600A	Corn Chops. Corn Chops.	W. H. Ogilvie. J. I. Robbins.	Guarantee Guarantee	9.00 9.00	3.50 3.40	3.50 3.00	70.00 70.00		
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COOPER, TEXAS.

149A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	25.00
109Y	Cottonseed Meal.....	Found....	43.82	8.00	8.37	26.52
149B	Cottonseed Cake.....	Guarantee	44.00	7.00	11.00	25.00	.....
108Y	Cottonseed Cake.....	Found....	44.35	6.92	8.43	26.21	.....
149C	Cottonseed Meal and Hulls	Guarantee	41.00	7.00	11.00	25.00	.....
149C	Cottonseed Meal and Hulls	Found....	39.42	7.82	10.90	27.81	.....
149D	Cottonseed Cake and Hulls	Guarantee	41.00	7.00	11.00	25.00	.....
149D	Cottonseed Cake and Hulls	Found....	40.19	7.00	12.04	26.17	.....

Cooper Cotton Oil Co.....

CORDELL, OKLAHOMA.

881A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00
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Lorenz & Geis.....

CORPUS CHRISTI, TEXAS.

1845A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	23.00
78T	Cottonseed Meal.....	Found....	45.00	8.52	9.33	23.84	.....
89T	Cottonseed Meal.....	Found....	44.68	8.38	8.26	23.95	.....
1845B	Cottonseed Cake.....	Guarantee	44.00	7.00	11.00	23.00	.....
79T	Cottonseed Cake.....	Found....	43.37	7.58	8.91	26.06	.....
2155A	Corn Chops.....	Guarantee	9.50	3.50	3.00	70.00	.....
2155A	Corn Chops.....	Found....	11.06	4.02	2.64	70.39	.....
1513A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	.....
80T	Corn Chops.....	Found....	10.94	4.80	2.21	70.65	.....
91T	Corn Chops.....	Found....	10.63	3.68	2.14	70.53	.....
1513B	Mixed Chops.....	Guarantee	9.25	3.00	3.00	70.50	.....
1513C	Kafir Chops.....	Guarantee	9.50	2.75	3.00	71.00	.....
1513D	Milo Chops.....	Guarantee	9.50	2.50	3.00	71.00	.....
92T	Milo Chops.....	Found....	13.25	2.68	1.98	68.85	.....
1513E	Mixed Chops.....	Guarantee	9.25	3.00	3.00	70.00	.....
1513F	Feterita Chops.....	Guarantee	9.00	2.75	3.00	68.00	.....

Corpus Christi Cotton Oil Co.

W. P. L. Lehman.....

Taylor Grain and Elevator Co.

Corn and kafir chops.

Corn and milo chops.

TEXAS AGRICULTURAL EXPERIMENT STATION.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen- Free Extract.	Ingredients.	Remarks.
335A	Corn Chops.....	Electric Corn Mill.....	Guarantee	9.00	3.00	3.00	70.00		
336B	Milo Chops.....		Guarantee	9.00	2.50	3.50	71.00		
335C	Corn Bran.....		Guarantee	9.00	5.00	10.50	63.00		
131A	Cottonseed Meal.....	Navarro Cotton Oil Co.....	Guarantee	44.00	7.00	11.00	23.00		
22B	Cottonseed Meal.....		Found.....	45.94	7.87	8.68	24.12		
131B	Prime Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	23.00		
548A	Cottonseed Meal.....	Southland Cotton Oil Co. . .	Guarantee	44.00	7.00	11.00	24.00		Adulterated hulls.
21B	Cottonseed Meal.....		Found.....	43.21	7.00	11.84	25.68		
548B	Screened Cottonseed Cake..		Guarantee	44.00	7.00	11.00	24.00		
23B	Screened Cottonseed Cake..		Found.....	36.69	5.59	15.06	27.26		
548C	Cottonseed Meal and Hulls		Guarantee	41.00	6.00	19.00	22.00		
548C	Cottonseed Meal and Hulls		Found.....	41.06	6.53	11.23	27.73		
204A	Corn Chops.....	C. R. Terry.....	Guarantee	9.00	4.00	2.50	70.00		
204B	Chicken Feed.....		Guarantee	9.50	2.50	3.25	63.00	Wheat, corn chops, milo, and sun- flower seed.	
204C	Milo Chops.....		Guarantee	8.50	2.75	3.00	69.00		
CRISP, TEXAS.									
169A	Corn Chops.....	R. S. Sparkman.....	Guarantee	9.00	3.00	2.50	70.00		
1635A	Corn Chops.....	H. P. Cokes.....	Guarantee	9.00	3.00	3.50	70.00		
CROCKETT, TEXAS.									
573A	Cottonseed Meal.....		Guarantee	44.00	7.00	11.00	22.00		Adulterated hulls.
51R	Cottonseed Meal.....		Found.....	36.28	7.06	13.80	28.13		

573B	Crockett Cow Feed.....	Houston County Oil Mill and Manufacturing Co.	Guarantee	10.50	1.50	40.00	30.00	Cottonseed meal and hulls
573C	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	22.00	.....
573D	Crockett Horse Feed.....		Guarantee	13.00	3.50	10.00	56.00	Ground ear corn and cottonseed meal.
573E	Crockett Ox Feed.....		Guarantee	11.00	3.00	10.00	56.00	.....
573F	Cottonseed Cake and Hulls		Guarantee	40.00	8.00	13.00	20.00	.....
573G	Mix-O-Grain.....		Guarantee	13.60	2.55	14.80	49.40	Milo head chops, cottonseed meal and hulls and molasses.
573H	Crockett Cottonseed Meal and Hulls.		Guarantee	40.00	8.00	13.00	20.00	.....
573I	Milo-Mix.....		Guarantee	12.00	2.60	7.25	60.00	Milo head chops, cottonseed meal and molasses.
573J	Crockett M. & M. Mixed Feed.		Guarantee	9.50	2.50	7.50	62.00	Ground milo head and molasses.
573K	Crockett M. & M. Mixed Feed.		Found....	8.12	1.87	6.13	64.21	.....
2195A	Mixed Chops.....	B. L. Satterwhite.....	Guarantee	9.75	2.75	3.00	70.00	Sorgo and milo chops
2195A	Mixed Chops.....		Found....	10.63	3.15	2.78	70.89	.....

CROSS PLAINS, TEXAS.

2134A	Corn Chops.....	Cross Plains Gin Co.....	Guarantee	9.50	3.50	3.00	70.00	.....
2134A	Corn Chops.....		Found....	9.01	4.01	2.30	71.42	.....
2103A	Corn Chops.....	Farmers Gin Co.....	Guarantee	9.00	3.50	3.00	70.00	.....
2103A	Corn Chops.....		Found....	9.44	3.74	2.31	72.25	.....

CROWELL, TEXAS.

1597A	Corn Chops.....	Bell Grain Co.....	Guarantee	9.00	3.50	3.00	70.00	.....
1597B	Milo Chops.....		Guarantee	9.50	2.50	3.00	71.00	.....
1597C	Wheat Chops.....		Guarantee	12.00	2.00	2.00	71.00	.....
1597D	Wheat Mixed Feed.....		Guarantee	16.00	3.50	8.50	55.00	Wheat bran and shorts.
1597D	Wheat Mixed Feed.....		Found....	19.46	3.96	7.43	53.56	.....

TEXAS AGRICULTURAL EXPERIMENT STATION.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Extract.	Ingredients.	Remarks.
2120A	Rice Bran and Hulls.	American Rice Milling Co.	Guarantee	12.00	10.00	18.00	40.00	.....
2120A	Rice Bran and Hulls.		Found....	10.06	10.31	18.41	38.09	.....
1332A	X. L. Stock Feed.	Lawrence Brothers.	Guarantee	9.50	4.00	15.00	50.00	Rice bran, corn, molasses, cottonseed meal and salt.	
634A	Nutriline Stock Feed.	Nutriline Milling Co.	Guarantee	11.00	4.50	12.00	53.00	Rice bran, corn, cottonseed and alfalfa meal, kafir chops and molasses and salt.	
634A	Nutriline Stock Feed.		Found....	9.20	5.85	12.23	52.17	.....	Adul. rice hulls.
48B	Nutriline Stock Feed.		Found....	8.85	4.89	8.43	56.89	.....
7Y	Nutriline Stock Feed.		Found....	10.47	1.51	13.36	53.76	.....
634B	Nutriline Momylk Dairy Feed.		Guarantee	15.00	4.50	12.00	48.00	Rice bran, corn, molasses, cottonseed and alfalfa meal, rice polish and salt.	
8Y	Nutriline Momylk Dairy Feed.	Nutriline Milling Co.	Found....	13.75	.56	15.67	47.81	.....
46B	Nutriline Momylk Dairy Feed.		Found....	12.24	5.53	11.03	47.89	.....
438C	Nutriline Chicken Feed.		Guarantee	10.00	3.00	5.00	65.00	Corn chops, milo, kafir, wheat, barley, rice and sunflower seed.	
634D	Corn Chops.		Guarantee	9.00	3.00	3.50	69.00	.....
634E	Nutriline Ox Feed.		Guarantee	9.00	2.00	15.00	45.00	Alfalfa and cottonseed meal, corn rice bran, molasses and salt.	
634F	Nutriline Special Stock Feed	Nutriline Milling Co.	Guarantee	10.00	3.50	12.00	50.00	Rice bran, corn, cottonseed and alfalfa meal, molasses and salt.	
634G	Muline Stock Feed.		Guarantee	10.00	3.50	12.00	50.00	Rice bran, corn, cottonseed and alfalfa meal, molasses and salt.	
47B	Muline Stock Feed.		Found....	9.55	5.83	9.93	53.92	.....
9Y	Muline Stock Feed.		Found....	12.13	.96	13.88	52.36	.....

634H	Special Muline Stock Feed..	Guarantee	9.00	2.50	12.00	50.00	Alfalfa and cottonseed meal, corn, oats, rice bran, molasses and salt.
634I	X. L. Stock Feed with Peat.	Guarantee	7.00	1.50	20.00	50.00	Peat, salt, cottonseed and alfalfa meal, oat clippings, screenings, rice straw, corn and molasses.
634J	Muline Stock Feed.....	Guarantee	10.00	3.50	12.00	50.00	Rice bran, corn and kafir chops, cottonseed and alfalfa meal, molasses and salt.
634J	Muline Stock Feed.....	Found.....	11.38	6.45	11.72	51.52	
113T	Muline Stock Feed.....	Found.....	10.81	7.86	12.76	48.95	
634K	Oats Special Nutrline Mixed Feed.	Guarantee	9.00	1.50	12.00	50.00	Cottonseed and alfalfa meal, oats, molasses, oat clippings, grain screenings and salt.
634K	Oats Special Nutrline Mixed Feed.	Found.....	11.17	3.78	14.93	51.17	

CUERO, TEXAS.

41A	Corn Chops.....	Guarantee	10.00	3.00	3.00	70.00	
41B	Corn Bran.....	Guarantee	7.50	2.85	12.55	55.85	
41C	Corn and Cob Meal.....	Guarantee	7.75	3.25	6.25	65.00	
74T	Corn and Cob Meal.....	Found.....	8.75	3.21	7.56	68.55	
402A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	22.00	
37T	Cottonseed Meal.....	Found.....	48.62	8.43	6.46	24.34	
402B	Cottonseed Cake.....	Guarantee	44.00	7.00	11.00	22.00	
60A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	
60B	Corn Bran.....	Guarantee	8.00	5.00	6.29	69.01	
60C	Crushed Ear Corn.....	Guarantee	8.00	3.00	8.00	65.00	
60D	Corn Chops and Corn Bran	Guarantee	9.00	4.00	7.00	65.00	
877A	Chicken Feed.....	Guarantee	9.00	3.50	3.00	70.00	Milo, corn chops and screenings.
877B	Chicken Feed.....	Guarantee	9.00	3.50	3.00	70.00	Milo, corn chops and sorgo seed.
877B	Chicken Feed.....	Found.....	10.99	3.13	2.23	71.25	

CUMBY, TEXAS.

582A	Cottonseed Meal.....	Guarantee	44.00	8.00	11.00	24.00	
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CUSTER CITY, OKLAHOMA.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Extract.	Ingredients.	Remarks.
182A	Corn Chops.....	Custer Milling Co.....	Guarantee	9.00	4.00	2.00	60.00	.....	.....
182B	Kafir Chops.....		Guarantee	9.50	2.50	3.50	69.00	.....	.....
182C	Wheat Mixed Feed.....		Guarantee	14.00	4.00	6.00	59.00	Wheat bran and shorts.	.....
182D	Wheat Bran.....		Guarantee	14.00	4.00	9.00	54.00	.....	.....
182E	Wheat Shorts.....		Guarantee	16.00	4.00	7.00	55.00	.....	.....

DAINGERFIELD, TEXAS.

555A	Cottonseed Meal.....	Daingerfield Cotton Oil Co..	Guarantee	44.00	7.00	11.00	22.00
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DALHART, TEXAS.

2198A	Corn Bran.....	Panhandle Mill Co.....	Guarantee	8.00	3.00	12.00	60.00
2003A	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....	.....
2003A	Corn Chops.....		Found....	9.20	4.08	2.08	73.79	.....	.....
91P	Corn Chops.....		Found....	9.50	4.27	2.20	73.28	.....	.....
2003B	Milo Chops.....		Guarantee.	10.00	3.00	2.75	68.00	.....	.....
2003B	Milo Chops.....	Schuhart Grain Co.....	Found....	10.12	2.97	2.03	72.09	.....	.....
89P	Milo Chops.....		Found....	10.88	2.72	2.65	70.68	.....	.....
2003C	Cottonseed Meal and Hulls		Guarantee	38.00	7.00	14.00	25.00	.....	.....
2003C	Cottonseed Meal and Hulls		Found....	37.67	8.82	12.28	29.23	.....	.....
2003D	Cottonseed Cake and Hulls		Guarantee	38.00	7.00	14.00	25.00	.....	.....
2003D	Cottonseed Cake and Hulls	.....	Found....	36.39	6.43	13.92	30.65	.....	.....
2003E	Old Process Linseed Oil Meal		Guarantee	31.93	8.00	7.00	42.00	.....	.....
2003E	Old Process Linseed Oil Meal		Found....	31.38	7.61	9.36	38.54	.....	.....

DALLAS, TEXAS.

2184A	Cottonseed Meal and Hulls	F. W. Brode & Co.....	Guarantee	41.00	6.00	15.00	23.00	.....	.....
2184A	Cottonseed Meal and Hulls		Found....	37.23	6.75	14.00	23.66	.....	.....

1935A	Corn Chops.	Guarantee	9.00	4.00	3.00	70.00	.....
1935B	Milo Chops.	Guarantee	11.45	2.50	3.45	71.83	.....
1935C	Our Best Baby Chick.	Guarantee	9.00	3.50	3.00	70.00	Ground wheat, corn and milo chops.
1935D	Our Best Baby Chick.	Found.....	12.69	2.42	3.50	68.67	.....
1935E	Our Best Hen Feed.	Guarantee	9.00	3.50	3.00	70.00	Corn chops, wheat and milo.
1935F	Our Best Hen Feed.	Found.....	12.51	2.31	2.31	70.43	.....
1935G	Kafir Chops.	Guarantee	10.50	2.75	3.00	69.50	.....
1935H	Kafir Chops.	Found.....	12.15	3.59	2.58	68.75	.....
1935I	Fertile Egg Mash.	Guarantee	10.00	3.00	12.00	56.00	Wheat bran and middlings, ground oats, corn meal and alfalfa.
1935J	Laying Mash.	Guarantee	15.00	3.00	6.00	53.00	Wheat bran and middlings, blood and kafir meal, alfalfa, red dog and corn meal.
1935K	Pigeon Food.	Guarantee	12.00	3.00	4.00	67.00	Corn, wheat, canadian peas, kafir hemp and millet.
1935L	Chick Food.	Guarantee	10.00	3.00	3.20	68.00	Corn, wheat, millet, kafir and oats.
1935M	Fattening Mash.	Guarantee	11.00	3.00	5.00	57.00	Wheat bran and shorts, kafir and corn meal, red dog and alfalfa.
1935N	Developing Food.	Guarantee	10.00	3.00	3.20	68.00	Corn, wheat, kafir and buckwheat.
1935O	Growing Mash.	Guarantee	10.00	3.00	10.00	52.00	Ground oats, corn meal, wheat middlings, alfalfa, bone and meat meal.
1935P	Scratching Food.	Guarantee	10.00	3.00	3.20	68.00	Corn, wheat, kafir, sunflower, buckwheat and oats.
844A	Dried Brewery Grain.	Guarantee	25.00	6.00	20.00	42.00	.....
844B	Brewer's Screenings.	Guarantee	16.00	1.00	12.00	60.00	.....
903A	Corn Chops.	Guarantee	9.00	4.00	3.00	70.00	.....
903B	Milo Chops.	Guarantee	10.00	2.50	3.00	71.00	.....
903C	Milo Chops.	Found.....	11.00	3.45	2.51	69.88	.....
903D	Blue Seal Hen Feed.	Guarantee	10.50	2.75	3.50	68.00	Corn chops, wheat, milo, kafir and sunflower seed.
903E	Blue Seal Hen Feed.	Found.....	12.43	2.42	2.92	67.64	.....
289A	Cottonseed Meal.	Guarantee	44.00	7.00	11.00	24.00	.....
95Y	Cottonseed Meal.	Found.....	38.63	7.53	13.32	28.53	.....
95Z	Cottonseed Meal.	Found.....	41.86	9.10	12.33	24.18	.....

Adulterated hulls.
Adulterated hulls.

DALLAS, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
96R	Cottonseed Meal.....	Dallas Oil and Refining Co. —Continued.	Found.....	38.38	9.58	12.94	27.23	.....	Adulterated hulls.
289B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	24.00	.....	Adulterated hulls.
94Y	Cottonseed Cake.....		Found.....	41.75	6.75	11.85	26.29	.....	Adulterated hulls.
289C	Doreo Mixed Feed.....		Guarantee	11.00	2.90	40.00	35.00	Cottonseed meal and hulls.....	
93Y	Doreo Mixed Feed.....		Found.....	16.52	2.49	36.87	31.45	.....
289D	Cottonseed Cake and Hulls		Guarantee	37.00	7.00	14.00	23.00	.....
289D	Cottonseed Cake and Hulls		Found.....	39.42	8.33	13.63	26.00	.....
82P	Cottonseed Cake and Hulls		Found.....	40.13	7.00	13.49	26.44	.....
289E	Cottonseed Meal and Hulls		Guarantee	37.00	7.00	14.00	23.00	.....
289E	Cottonseed Meal and Hulls		Found.....	37.57	8.20	13.81	28.44	.....
83P	Cottonseed Cake and Hulls		Found.....	37.75	6.93	14.72	28.45	.....	Excess hulls.
1818B	Chick Food.....	David Hardie Seed Co.....	Guarantee	10.00	3.50	3.00	70.00	Millet, crushed kafir and milo.....	
1650A	Milo Chops.....	Doggett Grain Co.....	Guarantee	9.00	2.75	3.00	68.00	.....
1650B	Kafir Chops.....		Guarantee	9.00	2.75	3.00	71.00	.....
1650C	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....
1650E	Wheat Bran and Screenings		Guarantee	15.00	3.00	9.00	54.00	.....
1831A	Cross Bar Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....
1831B	Cross Bar Hen Food.....	Knight Bros. Grain Co.....	Guarantee	11.00	2.50	3.25	66.00	Milo, wheat and corn chops.....	
1831C	Circle Key Hen Food.....		Guarantee	9.00	3.50	3.00	70.00	Wheat, corn, kafir, milo and sunflower seed.....	
1831D	Cross Bar Milo Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....
1831E	Cross Bar Sugar Feed.....		Guarantee	11.50	1.50	13.00	50.00	Corn chops, alfalfa, oat feed and molasses.....	
1831F	Cross Bar Mixed Bran.....		Guarantee	14.50	4.00	10.00	50.00	Rice and wheat bran.....	
1831G	Cross Bar Crushed Feed.....		Guarantee	10.30	2.80	12.00	50.00	Corn, milo, cottonseed and alfalfa meal and rice bran.....	
1831M	Cross Bar Dairy Feed.....		Guarantee	10.00	.50	14.00	45.00	Hominy feed, brewers' dried grain, cottonseed meal and peanut hulls.....	

Adul. corn bran.

1831K	Cross Bar Chick Feed.....	Guarantee	10.00	2.50	2.50	86.00	Milo, wheat and corn chops.
1831N	Mixed Feed.....	Guarantee	11.00	4.00	16.00	45.00	Hominy feed, wheat bran, rice hulls and oat screenings.
1268A	Mixed Bran.....	Guarantee	13.00	6.00	10.00	45.00	Wheat and rice bran.
1268B	Lawgro Feed.....	Guarantee	12.00	10.00	8.00	55.00	Rice bran and rice polish.
1268C	Chic-needa Hen Food.....	Guarantee	9.38	2.50	2.13	64.07	Wheat, corn chops, milo and sunflower seed.
1268D	Chic-a-needa Baby Chick...	Guarantee	9.54	2.31	1.68	70.84	Wheat, corn chops, milo and rice cracked.
1268E	Scratch Feed.....	Guarantee	6.00	2.00	20.00	50.00	Milo, kafir, wheat and oat screenings
1268F	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	.....
1268G	Queen of Dixie Alfalfa Feed	Guarantee	12.31	3.42	35.16	34.16	Corn chops, alfalfa meal, oat clip-pings.
1268H	Wheat Shorts and Rice Polish.	Guarantee	14.50	5.00	4.00	60.00	.....
1268H	Wheat Shorts and Rice Polish.	Found.....	14.83	8.68	4.75	57.15	.....
1268I	Queen of Dixie Egg Mash...	Guarantee	25.00	5.00	4.50	50.00	Milo chops, wheat shorts, wheat bran, cottonseed meal, beef, scraps and salt.
1268I	Queen of Dixie Egg Mash...	Found.....	20.86	5.36	6.46	52.21	.....
1268J	Corn Feed Meal.....	Guarantee	8.50	3.00	3.00	70.00	.....
1268K	Queen of Dixie Hen Feed...	Guarantee	9.00	3.50	3.00	70.00	Milo, wheat, corn chops, sunflower seed and rice.
1268L	Queen of Dixie Chick Feed.	Guarantee	9.00	3.50	3.00	70.00	Wheat, milo, corn and rice cracked.
1268M	Owl Hen Feed with Grit....	Guarantee	9.00	3.50	3.00	70.00	Wheat, kafir, milo, corn chops, sunflower seed, rice and grit.
91R	Owl Hen Feed with Grit....	Found.....	10.06	2.77	2.27	57.75	.....
1268N	Owl Chick Feed with Grit...	Guarantee	9.00	3.50	3.00	70.00	Wheat, kafir, milo, corn and rice cracked and grit.
1268O	Milo Chops.....	Guarantee	10.00	2.50	3.00	70.50	.....
1526A	Rice Bran and Rice Hulls...	Guarantee	10.50	10.50	18.00	37.00	.....
1526B	Corn and Milo Chops.....	Guarantee	9.50	3.00	3.00	70.00	.....
1526C	Milo Chops and Wheat Bran	Guarantee	11.50	2.70	4.25	61.00	.....
1696A	Wheat Shorts.....	Guarantee	16.00	4.00	4.00	60.00	.....
1696B	Wheat Bran.....	Guarantee	14.50	4.00	10.00	50.00	.....

Lawther Grain Co.

A. S. Lewis.

DALLAS, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen- Extr.	Ingredients.	Remarks.
1696C	Mixed Bran.	Morten Milling Co.	Guarantee	14.00	3.00	9.00	50.00	Wheat and corn bran.	
1696D	Corn Chops and Corn Bran		Guarantee	9.00	3.00	3.00	70.00		
1696E	Corn Chops.		Guarantee	9.00	3.50	3.00	70.00		
69P	Corn Chops.		Found	9.69	3.95	2.60	69.91		
1696F	Wheat Bran and Screenings		Guarantee	14.50	4.00	10.00	50.00		
1696G	Milo Chops.		Guarantee	10.00	2.50	3.00	70.50		
1696H	Mixed Feed		Guarantee	13.00	3.00	8.00	58.00	Wheat bran and milo chops.	
1696I	Mixed Feed.		Found	12.63	3.52	3.43	67.55		
1696J	Wheat Shorts and Pulverized		Guarantee	12.00	3.75	4.00	65.00		
1696K	Corn Meal.		Found	13.00	5.06	2.33	67.73		
1696L	Wheat Shorts and Pulverized		Guarantee	9.00	3.00	3.50	70.00		
1696M	Corn Meal.		Guarantee	9.00	2.50	3.00	70.00		
1393A	Corn Chops.		Guarantee	10.00	2.50	3.00	71.00		
1393B	Milo and Kafir Chops.		Found	10.75	1.86	2.39	72.10		
1393C	Milo Chops.		Guarantee	9.00	2.50	3.00	70.00		
1393D	Milo Chops.		Guarantee	9.00	3.50	3.00	70.00	Wheat, cane seed, corn, kafir, milo chops and millet seed.	
1393E	Chick Food.		Guarantee	9.00	3.25	3.00	70.00	Wheat, corn chops, kafir, milo and sunflower seed.	
1393F	Hen Food.		Guarantee	11.00	2.50	3.00	69.00		
1393G	Feterita Chops.		Found	13.00	2.59	1.80	69.52		
1393H	Feterita Chops.		Guarantee	14.50	3.00	10.00	50.00		
1815A	Wheat Bran.	Oak Cliff Milling Co.	Guarantee	44.00	7.00	11.00	24.00		
1850A	Cottonseed Meal.		Found	46.13	6.41	9.68	25.34		
30P	Cottonseed Cake.		Found	29.84	7.61	14.43	26.83		Adulterated hulls.
33R	Cottonseed Meal.		Found	27.23	7.50	15.43	26.83		Adulterated hulls.
34H	Cottonseed Meal.		Found	27.23	7.50	15.43	26.83		Adulterated hulls.

86R	Cottonseed Meal.....	Found.....	42.25	7.30	11.54	26.86	Adulterated hulls.
125T	Cottonseed Meal.....	Found.....	40.63	6.92	12.23	27.98	Adulterated hulls.
92Y	Cottonseed Meal.....	Found.....	43.79	6.96	11.75	25.06	Adulterated hulls.
1850B	Cottonseed Cake.....	Guarantee.....	44.00	7.00	11.00	24.00	Adulterated hulls.
79P	Cottonseed Cake.....	Found.....	42.69	5.62	12.49	26.31	Adulterated hulls.
84P	Cottonseed Cake.....	Found.....	42.92	5.76	11.68	26.10	Adulterated hulls.
91Y	Cottonseed Cake.....	Found.....	44.13	5.23	11.54	26.31	Adulterated hulls.
110T	Cottonseed Cake.....	Found.....	43.76	5.94	11.14	26.10	Adulterated hulls.
111T	Cottonseed Cake.....	Found.....	43.75	5.96	11.21	25.91	Adulterated hulls.
1850C	Mixed Feed.....	Guarantee.....	10.50	3.00	40.00	30.00	Cottonseed meal and hulls.
90Y	Mixed Feed.....	Found.....	12.19	2.03	40.07	32.60	Adulterated hulls.
2159A	Texdale Calf Meal.....	Guarantee.....	23.00	5.00	6.00	44.00	Wheat flour, honey locust bean meal,
2159A	Texdale Calf Meal.....	Found.....	25.44	5.36	8.12	46.92	bean, linseed, cocoa shell, cotton-
							seed meal, ground fennugreek,
							ground anise and salt.
51A	Corn Chops.....	Guarantee.....	10.50	5.25	3.00	67.50	
51B	Wheat Bran.....	Guarantee.....	14.56	4.20	9.52	55.73	
51C	Wheat Shorts.....	Guarantee.....	16.00	3.50	4.00	60.00	
51F	Corn Bran.....	Guarantee.....	7.50	4.00	15.00	55.00	
51G	Kafir Chops.....	Guarantee.....	10.00	3.75	10.00	53.00	
51H	Corn Chops and Corn Bran	Guarantee.....	9.12	4.48	2.61	70.88	
51J	Mixed Bran and Screenings	Guarantee.....	16.50	4.00	9.50	52.00	Wheat and corn bran and screenings
51K	Wheat Bran and Screenings	Guarantee.....	16.00	4.25	10.50	50.40	
84B	Wheat Bran and Screenings	Found.....	16.32	4.33	9.29	52.19	
58R	Wheat Bran and Screenings	Found.....	16.62	4.19	9.41	51.36	
51L	Hominy Feed.....	Guarantee.....	9.71	8.13	9.67	59.35	
51M	Chick Feed.....	Guarantee.....	17.68	4.73	2.48	61.22	Corn meal, wheat germs, cracked
							wheat.
51N	Blue Hen Chicken Feed.....	Guarantee.....	14.34	2.61	3.21	68.25	Corn chops, milo, kafir, wheat and
							oats.
51O	Milo Chops.....	Guarantee.....	11.00	2.70	2.70	68.00	
51P	Wheat Bran, Screenings and	Guarantee.....	14.50	4.50	9.00	54.00	
	Hominy Feed.....						
1545A	Blue Ribbon Corn Chops...	Guarantee.....	9.00	3.50	3.00	70.00	
1545B	Blue Ribbon Chick Food...	Guarantee.....	9.00	3.00	3.00	70.00	Wheat, milo, corn chops.
1545D	Dried Brewer's Grain.....	Guarantee.....	22.00	6.00	18.00	40.00	

Planters Cotton Oil Co.....

Sears Roebuck & Co.....

Stanard-Tilton Milling Co.

Steger Grain Co.....

DALLAS, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Free Extract.	Ingredients.	Remarks.
1545C	Blue Ribbon Hen Food.....	Steger Grain Co.—Cont'd.	Guarantee	9.00	3.00	3.00	70.00	Corn chops, wheat, milo and sub-flower seed.	
1545E	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50		
1545F	Rex Hen Food with Grit.....		Guarantee	10.00	2.50	3.25	68.25	Milo, corn chops, wheat and grits.	
92R	Rex Hen Food with Grit.....		Found....	10.75	2.65	2.33	68.07		
1545G	Corn and Milo Chops.....		Guarantee	9.50	3.00	3.00	70.25		
1991A	Prime Cottonseed Meal.....		Guarantee	44.00	7.00	11.00	23.00		
1991A	Prime Cottonseed Meal.....		Found....	45.65	8.76	8.96	24.24		
1991B	Sunset Brand Cottonseed Meal and Hulls.		Guarantee	41.00	5.00	14.00	24.00		
1991B	Sunset Bran Cottonseed Meal and Hulls.		Found....	41.01	6.24	13.21	26.54		
1991C	Interstate Brand Cottonseed Meal and Hulls.		Guarantee	38.62	5.00	17.00	22.00		
1991C	Interstate Brand Cottonseed Meal and Hulls.	Texas Cake and Linter Co.	Found....	38.73	7.41	14.28	26.47		
93R	Interstate Brand Cottonseed Meal and Hulls.		Found....	39.47	8.44	10.53	28.25		
1991D	Centex Brand Cottonseed Meal and Hulls.		Guarantee	30.00	4.00	20.00	25.00		
1991D	Centex Brand Cottonseed Meal and Hulls.		Found....	31.88	5.97	18.64	29.75		
1991E	Centex Brand Cottonseed Cake and Hulls.		Guarantee	30.00	4.00	20.00	25.00		
1991E	Centex Brand Cottonseed Cake and Hulls.		Found....	30.73	5.31	19.61	30.69		
1991F	Sunset Brand Cottonseed Cake and Hulls.		Guarantee	41.00	5.00	14.00	24.00		
1991F	Sunset Brand Cottonseed Cake and Hulls.		Found....	43.00	5.88	11.65	25.98		

1991G	Interstate Brand Cottonseed Cake and Hulls.	Guarantee	36.00	5.00	17.00	22.00	
1991G	Interstate Brand Cottonseed Cake and Hulls.	Found....	37.38	6.48	12.75	29.63	
1991H	Panhandle Brand Cottonseed Meal and Hulls.	Guarantee	36.00	5.00	19.00	21.00	
1991H	Panhandle Brand Cottonseed Meal and Hulls.	Found....	33.66	6.74	16.07	30.22	
90B	Panhandle Brand Cottonseed Meal and Hulls.	Found....	34.25	8.12	13.72	29.97	
1849A	Texseed Chick Food with Grit.	Guarantee	9.00	3.50	3.00	70.00	Milo crushed, corn chops, grit, corn meal, kafir and wheat crushed and beef scrap.
1849B	Texseed Hen Food with Grit.	Guarantee	9.00	3.50	3.00	70.00	Corn chops, milo, kafir, wheat, sunflower seed, beef scrap, grit and shell.
120A	Trico Mixed Feed.	Guarantee	10.50	3.00	40.00	30.00	Cottonseed meal and hulls.
96Y	Trico Mixed Feed.	Found....	10.85	3.06	41.74	31.26	
120B	Cottonseed Meal.	Guarantee	44.00	7.00	11.00	24.00	
98Y	Cottonseed Meal.	Found....	46.78	6.78	9.40	24.63	
120C	Cottonseed Crk.	Guarantee	44.00	7.00	11.00	24.00	
97Y	Cottonseed C.c.l.c.	Found....	47.13	6.66	8.62	24.29	

Texas Seed and Floral Co.

DATURA, TEXAS.

1215A	Corn Chops.	Guarantee	9.00	3.50	3.50	70.00	
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J. T. Pritchard & Son.

DAVENPORT, IOWA.

2058A	Tom Boy Horse Mixed Feed	Guarantee	9.00	2.00	18.00	50.00	Cracked corn, oats, alfalfa and cottonseed meal, oat meal mill by-products (oat shorts, hulls and middlings) and molasses.
2058A	Tom Boy Horse Mixed Feed	Found....	10.75	2.59	17.83	55.34	
2058B	Tom Boy Scatch Mixed Feed.	Guarantee	10.00	3.00	5.00	60.00	Cracked corn, barley, kafir, milo, sunflower seed, wheat and re-cleaned wheat screenings.

Purity Oats Co.

DAVENPORT, IOWA—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Extract.	Ingredients.	Remarks.
2058B	Tom Boy Scratch Mixed Feed.	Purity Oats Co.—Cont'd..	Found . . .	10.65	3.10	3.64	68.31		
2058C	Iowa Scratch Mixed Feed..		Guarantee	10.00	3.25	5.00	65.00	Cracked corn, barley, kafir, milo, sunflower seed, oat groats, whole wheat and re-cleaned wheat screenings.	
2058C	Iowa Scratch Mixed Feed..		Found . . .	10.94	2.68	2.65	70.21		
2058D	Tom Boy Mixed Chick Feed		Guarantee	10.00	3.00	5.00	60.00	Corn, wheat, kafir, milo cracked, steel cut oats, millet and re-cleaned wheat screenings.	
2058D	Tom Boy Mixed Chick Feed		Found . . .	10.94	3.06	2.84	71.97		
2058E	Iowa Mixed Chick Feed....		Guarantee	10.00	3.50	5.00	65.00	Corn, wheat, kafir, milo cracked, steel cut oats, millet and re-cleaned wheat screenings.	
2058E	Iowa Mixed Chick Feed....		Found . . .	11.13	2.97	2.92	70.45		

DAWSON, TEXAS.

393A	Corn Chops.....	Dawson Milling Co.	Guarantee	9.00	3.50	3.50	70.00		
427A	Cottonseed Meal.....		Guarantee	44.70	8.00	11.00	24.00		
60B	Cottonseed Meal.....	Dawson Oil Mill.	Found . . .	40.94	7.14	12.10	25.23		
427B	Cottonseed Cake.....		Guarantee	44.00	8.00	11.00	24.00		Adulterated hulls.
1874A	Cold Pressed Cottonseed.....	McLain Gin Co.	Guarantee	28.00	6.00	26.00	30.00		

DECATUR, TEXAS.

2065A	Corn Chops.....	F. H. Battern.	Guarantee	9.00	3.50	3.00	70.00		
2065A	Corn Chops.....		Found . . .	10.94	4.51	2.07	69.26		

1906A	Milo Chops.	Decatur Grain Co.	Guarantee	10.00	2.50	3.00	70.50	
1906B	Corn Chops.		Guarantee	9.00	3.50	3.00	70.00	
1906C	Mixed Chops.		Guarantee	9.50	3.00	3.00	70.00	Corn and milo chops.
1906D	Mixed Chops.		Guarantee	10.00	2.50	3.00	69.00	Kafir and milo chops.
185A	Corn Chops.		Guarantee	9.81	3.45	2.57	72.13	
185C	Mixed Feed.		Guarantee	12.50	3.50	6.00	60.00	Wheat bran and kafir chops
185E	Milo Chops.		Guarantee	9.00	2.50	3.00	70.00	
185J	Mixed Bran, Shorts and Ground Screenings.	Lillard Milling Co.	Guarantee	15.00	3.85	8.00	54.00	Wheat and corn bran, wheat shorts and ground screenings.
185K	Wheat Shorts.		Guarantee	15.50	6.00	4.00	55.00	
185L	Wheat and Oat Chops.		Guarantee	13.00	2.00	5.00	60.00	
1062A	Cottonseed Meal.		Guarantee	44.00	8.00	11.00	24.00	Adulterated hulls.
8P	Cottonseed Meal.		Found	42.94	6.83	12.27	26.14	Adulterated hulls.
40R	Cottonseed Meal.		Found	35.38	9.82	16.38	27.37	Adulterated hulls.
1062B	Cottonseed Cake.	Southland Cotton Oil Co.	Guarantee	44.00	8.00	11.00	24.00	Adulterated hulls.
7P	Cottonseed Cake.		Found	41.63	6.22	11.61	26.64	Adulterated hulls.
40P	Cottonseed Cake.		Found	40.88	7.97	13.12	23.97	Adulterated hulls.
41R	Cottonseed Cake.		Found	39.63	8.38	13.15	25.89	Adulterated hulls.

DEKALB, TEXAS.

683B	Corn Chops	DeKalb Milling Co.	Guarantee	9.00	3.00	3.00	70.00	
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DELEON, TEXAS.

2163A	Kafir Chops.	W. C. Lightfoot.	Guarantee	10.50	2.75	3.00	69.50	
2163A	Kafir Chops.		Found	9.99	2.75	2.24	71.35	
2163B	Milo Chops.		Guarantee	10.00	2.50	3.00	71.00	
2163B	Milo Chops.		Found	10.25	2.86	2.94	71.14	
2190A	Corn Chops.	A. J. Love.	Guarantee	9.50	3.50	3.00	70.00	
2190A	Corn Chops.		Found	9.83	4.04	2.17	73.31	
1611A	Corn Chops.	C. F. Morris.	Guarantee	9.00	3.50	3.00	70.00	

DELPHOS, KANSAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Ex- tract.	Ingredients.	Remarks.
1115A	Wheat Bran.....	{ Delphos Milling Co..... }	Guarantee	14.50	3.75	10.00	50.00		
1115B	Wheat Shorts.....		Guarantee	16.82	4.00	5.00	60.00		

DEL RIO, TEXAS.

1732A	Corn Chops.....	{ John Y. Long..... }	Guarantee	9.00	3.50	3.00	70.00		
1732B	Ear Corn Chops.....		Guarantee	8.00	3.00	8.00	65.00		
1879A	Corn Chops.....	{ Migul Diego..... }	Guarantee	9.00	3.50	3.00	70.00		

DENISON, TEXAS.

1243A	Corn Chops.....	{ Denison Mill and Grain Co. }	Guarantee	10.00	4.00	2.75	70.00		
1243B	Kafir Chops.....		Guarantee	9.50	2.75	3.00	71.00		
1243C	Kafir and Corn Chops.....		Guarantee	9.25	3.00	3.00	70.50		
1243D	Corn Chops and Corn Bran		Guarantee	9.00	3.50	3.00	70.00		
1243E	Makemlay Chicken Feed...		Guarantee	11.50	2.50	3.00	71.00	Wheat, corn chops and milo...	
1243F	Milo Chops.....		Guarantee	9.50	2.75	3.00	71.00		
216A	Cottonseed Meal.....	{ Industrial Cotton Oil Pro- perties. }	Guarantee	44.00	7.00	11.00	23.00		
76Y	Cottonseed Meal.....		Found.....	46.13	9.56	7.97	24.31		Adulterated hulls.
77R	Cottonseed Meal.....		Found.....	40.95	8.83	11.37	26.00		Adulterated hulls.
78R	Cottonseed Meal.....		Found.....	41.11	8.57	11.25	21.33		Adulterated hulls.
216C	Screened Cottonseed Cake..		Guarantee	44.00	7.00	11.00	23.00		
79R	Screened Cottonseed Cake..		Found.....	42.38	7.63	12.23	19.47		
216D	Cottonseed Meal and Hulls		Guarantee	43.00	7.00	12.00	23.00		
216D	Cottonseed Meal and Hulls		Found.....	44.32	7.03	9.67	26.29		
26A	Corn Chops.....	{ }	Guarantee	9.00	3.00	3.50	70.00		
26B	Milo Chops.....		Guarantee	9.50	2.50	3.00	71.00		

26C	Kafir Chops.....	Guarantee	9.50	2.75	3.00	71.00	.....
26D	Wheat Bran and Milo Chops	Guarantee	11.00	2.75	5.00	65.00	.....
26E	Corn Chops and Corn Bran	Guarantee	9.00	3.00	3.50	70.00	.....
26F	Wheat Shorts.....	Guarantee	15.00	3.00	5.00	60.00	.....
26G	Wheat Mixed Feed and Screenings.	Guarantee	14.50	3.00	9.00	55.00	Wheat bran, shorts and screenings.
26H	Chicken Feed.....	Guarantee	9.00	3.00	3.50	60.00	Wheat, milo, kafir and corn chops and wheat screenings.
2056A	Milo Chops.....	Guarantee	9.50	2.75	3.00	71.00	.....
2056A	Milo Chops.....	Found.	12.75	2.75	1.95	68.97	.....
2056B	Mixed Feed.....	Guarantee	14.00	3.05	7.00	60.00	Wheat bran, milo chops and wheat screenings.
2056B	Mixed Feed.....	Found.	14.63	2.95	3.85	64.14	.....
2056C	Corn Chops and Corn Bran	Guarantee	9.00	3.50	3.00	70.00	.....
2056C	Corn Chops and Corn Bran	Found.	10.31	4.34	2.96	69.22	.....
2056D	Makemlay Chicken Feed...	Guarantee	11.50	2.50	3.00	71.00	Corn chops, wheat and milo.
2056D	Makemlay Chicken Feed...	Found.	11.81	2.92	2.59	69.88	.....
280A	Corn Chops.....	Guarantee	9.00	4.00	3.00	71.00	.....

DENTON, TEXAS.

8A	Corn Chops.....	Guarantee	9.18	4.16	2.60	72.47	.....
8B	Wheat Bran.....	Guarantee	14.62	4.13	7.20	63.94	.....
8C	Mixed Feed.....	Guarantee	14.00	3.00	7.50	55.50	Wheat bran and low grade flour.
8D	Mixed Bran and Ground Screenings.	Guarantee	15.00	4.50	9.25	55.00	Corn and wheat bran and ground screenings.
8E	Low Grade Flour.....	Guarantee	15.34	2.84	1.48	68.34	.....
8F	Mixed Feed.....	Guarantee	14.77	3.66	6.55	60.26	Wheat and corn bran and kafir.
8G	Corn Chops and Wheat Flour.	Guarantee	9.00	3.50	3.00	70.00	.....
8H	Wheat Bran and Screenings	Guarantee	14.62	4.18	10.00	50.00	.....
8I	Wheat Shorts.....	Guarantee	15.34	2.80	5.00	67.00	.....
8J	Corn Chops and Corn Bran	Guarantee	8.00	3.00	3.50	65.00	.....
8K	Mixed Feed.....	Guarantee	10.00	2.50	3.00	70.50	Wheat bran and milo meal.
485A	Corn Chops.....	Guarantee	9.00	3.00	2.44	69.18	.....
485B	Milo Chops.....	Guarantee	10.00	2.50	3.00	70.50	.....

DENTON, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Ex- tract.	Ingredients.	Remarks.
2147A	Milo Head Chops.	E. A. Brewer.....	Guarantee	9.75	2.40	7.50	65.00		
2147A	Milo Head Chops.		Found....	11.25	2.39	5.25	68.58		
34A	Corn Chops.		Guarantee	9.00	4.00	3.00	70.00		
34B	Wheat Bran.		Guarantee	14.50	3.50	10.00	50.00		
34C	Corn Chops and Co.n Bran		Guarantee	9.00	4.00	3.00	70.00		
34D	Mixed Feed.	Denton Milling Co.....	Guarantee	12.00	3.10	6.50	61.50	Wheat bran and kafir meal.	
34E	Mixed Bran and Screenings		Guarantee	14.50	4.00	10.00	50.00	Wheat and corn bran and wheat screenings.	
34F	Wheat Shorts.		Guarantee	15.00	3.00	3.00	68.00		
34G	Wheat Bran. Shorts and Screenings.		Guarantee	14.50	3.50	10.00	50.00		
34H	Milo Chops.		Guarantee	10.00	2.50	3.00	70.50		
34I	Corn Bran.		Guarantee	10.00	5.25	10.00	60.00		
34I	Corn Bran.		Found....	9.18	4.62	13.09	60.43		
34J	Mixed Feed.		Guarantee	12.00	3.10	6.50	61.50	Wheat and corn bran and milo meal.	
34J	Mixed Feed.		Found....	13.13	3.96	6.79	63.33		
34K	Wheat and Corn Bran.		Guarantee	14.50	3.50	10.00	50.00		
34K	Wheat and Corn Bran.		Found....	17.62	5.01	8.95	53.94		
34K	Wheat Shorts and Screenings.								
34K	Wheat Shorts and Screenings.								
34K	Wheat Shorts and Screenings.								
34K	Wheat Shorts and Screenings.								
107A	Cottonseed Meal.	Denton Oil and Gin Co....	Guarantee	44.00	7.00	11.00	23.00		Adulterated hulls.
100Y	Cottonseed Meal.		Found....	40.07	7.26	14.01	25.93		Adulterated hulls.
46R	Cottonseed Meal.		Found....	38.25	6.80	14.58	27.38		
107B	Cow Joy.		Guarantee	10.50	2.75	40.00	30.00	Cottonseed meal and hulls.	
107C	Cottonseed Cake.		Guarantee	44.00	7.00	11.00	23.00		
99Y	Cottonseed Cake.		Found....	36.36	5.63	17.04	26.36		Adulterated hulls.
49P	Cottonseed Cake.		Found....	42.98	6.25	12.08	28.78		Adulterated hulls.

107D	Cottonseed Cake and Hulls	Guarantee	41.00	6.50	12.00	23.00
107D	Cottonseed Cake and Hulls	Found	41.50	7.08	10.86	25.52
107E	Cottonseed Meal and Hulls	Guarantee	41.00	6.50	12.00	23.00
107E	Cottonseed Meal and Hulls	Found	40.69	9.43	10.97	25.26

DENVER, COLORADO.

396A	Colorado White Wheat Bran	Guarantee	15.62	4.05	8.55	58.17
396B	Corn Chops	Guarantee	9.00	3.50	3.00	70.00
396C	Cracked Corn	Guarantee	9.00	3.50	3.00	70.00
396D	Wheat Mixed Feed	Guarantee	15.62	4.05	8.55	55.17
396E	Wheat Mixed Feed and Screenings.	Guarantee	15.62	4.05	8.55	58.17
83B	Wheat Mixed Feed and Screenings.	Found	15.13	4.29	7.78	56.55
396F	Stock Corn Meal	Guarantee	8.00	3.25	4.00	68.00
1182A	Wheat Mixed Feed	Guarantee	17.00	3.00	8.00	52.00
550A	Wheat Mixed Feed	Guarantee	15.00	3.00	10.00	55.00
550B	Wheat Bran and Screenings	Guarantee	15.00	3.00	10.00	55.00
1008A	Wheat Bran	Guarantee	15.30	3.40	8.78	56.72
1008B	Wheat Mixed Feed and Screenings.	Guarantee	15.30	3.40	8.78	56.72
74P	Wheat Mixed Feed and Screenings.	Found	14.22	3.96	8.66	57.89

Crescent Mill and Elevator Co.

Excelsior Milling and Elevator Co.

Hungarian Milling and Elevator Co.

Longmont Farmers Milling and Elevator Co.

DEPORT, TEXAS.

527A	Cottonseed Meal	Guarantee	44.00	7.00	11.00	24.00
128Y	Cottonseed Meal	Found	43.69	7.14	9.24	25.46

DETROIT, TEXAS.

291A	Cottonseed Meal	Guarantee	44.00	7.00	11.00	24.00
71Y	Cottonseed Meal	Found	45.25	8.08	7.62	25.45

DETROIT, MICHIGAN.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Pat.	Crude Fiber.	Nitrogen-Free Extract.	Ingredients.	Remarks.
1550A	Dried Beet Pulp	Larowe Milling Co.	Guarantee	8.00	.50	20.00	58.00		

DEWALT, TEXAS.

1634A	Dew Drop Cow Feed	Dew Brothers Co., Inc.	Guarantee	18.00	2.00	36.00	21.00	Cottonseed meal, molasses and sal.	
1634B	Top Notch Mixed Feed		Guarantee	20.00	1.10	24.00	35.00	Cottonseed meal and hulls, alfalfa meal, corn chops, molasses and salt.	

DODD CITY, TEXAS.

163A	Corn Chops	Brent Bros.	Guarantee	9.00	4.00	3.00	70.00		
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DODGE CITY, KANSAS.

798A	Wheat Bran	Dodge City Mill and Elevator Co.	Guarantee	14.50	3.50	10.00	50.00		
798B	Corn Chops		Guarantee	9.30	4.10	2.52	71.71		
798C	Wheat Shorts		Guarantee	16.90	4.28	3.63	63.11		
798D	Wheat Bran and Shorts		Guarantee	15.50	3.50	6.50	55.00		
798E	Wheat Bran and Screenings		Guarantee	17.81	3.25	10.27	51.16		
798F	Wheat Bran, Shorts and Screenings		Guarantee	15.50	3.50	6.50	55.00		

DODSONVILLE, TEXAS.

1659A	Corn Chops	W. A. Roach	Guarantee	9.00	3.50	3.00	70.00		
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DORCHESTER, TEXAS.

1453A	Corn Chops	M. C. Gault	Guarantee	9.00	4.00	3.00	70.00		
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DUBLIN, TEXAS.

584A	Cottonseed Meal and Hulls	Guarantee	41.00	6.00	12.00	22.00	
584A	Cottonseed Meal and Hulls	Found	43.57	7.49	10.31	25.38	
59W	Cottonseed Meal and Hulls	Found	39.41	7.31	13.13	26.52	
76W	Cottonseed Meal and Hulls	Found	38.76	6.89	14.28	27.10	
584B	Cottonseed Cake and Hulls	Guarantee	41.00	6.00	12.00	22.00	
584B	Cottonseed Cake and Hulls	Found	44.34	7.80	9.22	25.07	
60W	Cottonseed Cake and Hulls	Found	39.44	5.90	13.74	27.94	
584C	Cottonseed Meal and Hulls	Guarantee	38.00	15.00	23.00		
584C	Cottonseed Meal and Hulls	Found	38.25	6.13	14.13	28.33	
678A	Kafir Chops and Wheat Bran	Guarantee	14.20	3.49	5.58	62.60	
678B	Mixed Chops	Guarantee	9.90	3.70	2.60	71.50	Corn and kafir chops.
678C	Mixed Feed	Guarantee	14.16	3.64	6.98	62.17	Wheat and corn bran, and kafir.
678D	Milo and Kafir Chops	Guarantee	9.50	3.00	3.00	71.00	
678E	Wheat Chops	Guarantee	14.00	1.90	3.25	68.00	
678F	Wheat Shorts	Guarantee	16.00	4.00	5.00	60.00	
678G	Mixed Feed	Guarantee	11.70	3.15	6.50	62.00	Kafir, wheat and corn bran.
678H	Barley Chops	Guarantee	11.00	1.75	6.50	62.00	
678I	Mixed Bran	Guarantee	14.00	3.00	10.50	54.00	Wheat and corn bran.
678J	Mixed Feed	Guarantee	12.00	2.50	12.00	50.00	Wheat bran, rice hulls and wheat flour.
678K	Mixed Feed	Guarantee	11.25	3.50	15.00	42.00	Wheat bran, rice polish and rice hulls.
678L	Corn Chops	Guarantee	9.00	3.50	3.00	70.00	
2036A	Corn Chops	Guarantee	9.00	3.50	3.00	70.00	
2036A	Corn Chops	Found	8.63	4.74	2.56	70.12	

Bencini Cotton Oil Mills.

Dublin Mill and Elevator Co.

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DUNCAN, OKLAHOMA.

677A	Corn Chops	Guarantee	10.00	4.00	3.00	70.00	
1156A	Corn Chops	Guarantee	9.00	3.50	3.50	70.00	

Duncan Milling Co.

Stephen County Elevator Co.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
160A	Cottonseed Meal.....	Durant Cotton Oil Co.....	Guarantee	44.00	8.00	11.00	22.00	.....	.....
1754A	Corn Chops.....	Durant Grain and Elevator Co.	Guarantee	9.00	4.00	3.00	70.00	.....	.....
1080A	Corn Chops.....	Durant Mill and Elevator Co.	Guarantee	9.00	3.50	3.00	70.00	.....	.....
2037A	Corn Chops.....	Durant Milling Co.....	Guarantee	9.00	3.50	3.00	70.00	.....	.....
2037A	Corn Chops.....		Found....	10.44	3.67	1.79	70.59	.....	.....
1604A	Corn Chops.....	Farmers Gin and Elevator Co.	Guarantee	9.54	3.99	2.58	70.98	.....	.....
562A	Corn Chops.....	D. Head & Son.....	Guarantee	9.00	4.00	3.00	70.00	.....	.....

DURHAM, OKLAHOMA.

636A	Corn Chops.....	Goerke and Loewen.....	Guarantee	9.90	3.00	2.60	71.00
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EAGLE LAKE, TEXAS.

443A	Rice Polish.....	Farmers Rice Milling Co... {	Guarantee	11.00	6.00	3.00	55.00
57T	Rice Polish.....		Found....	11.13	5.98	1.60	67.57	.....	.....
443B	Rice Bran.....		Guarantee	11.00	10.00	12.00	40.00	.....	.....
20T	Rice Bran.....		Found....	13.85	13.77	9.66	43.23	.....	.....
382A	Corn Chops.....	White Eagle Milling Co... {	Guarantee	9.00	3.00	3.00	70.00	.....	.....
382B	Corn Bran.....		Guarantee	9.00	5.00	10.00	63.00	.....	.....
382B	Corn Bran.....		Found....	5.88	1.98	14.74	62.08	.....	Misbranded.

EAGLE PASS, TEXAS.

1786A	Wheat Bran.....	{	Guarantee	15.00	4.00	8.00	54.00
1786B	Wheat Bran and Screenings.....	{	Guarantee	16.61	2.75	8.91	58.75
2187A	Cottonseed Meal.....	{	Guarantee	44.00	7.00	11.00	23.00
2187A	Cottonseed Meal.....	{	Found	49.25	12.00	4.15	23.17
2187B	Cottonseed Cake.....	{	Guarantee	44.00	7.00	11.00	23.00
2187B	Cottonseed Cake.....	{	Found	43.66	9.56	9.13	26.03
2196A	Milo Head Chops.....	{	Guarantee	9.00	3.00	8.00	68.00
2196A	Milo Head Chops.....	{	Found	10.44	2.62	5.20	68.38

EAST BARNARD, TEXAS.

1797A	Cold Pressed Cottonseed.....	{	Guarantee	25.00	6.00	26.00	28.00
78T	Cold Pressed Cottonseed.....	{	Found	27.32	7.99	23.39	28.49

EATON, COLORADO.

1094A	Wheat Mixed Feed.....	{	Eaton Milling and Elevator Co.	14.50	3.50	10.00	50.00
							Wheat bran and shorts.....

EDDY, TEXAS.

906A	Corn Chops.....	{	Eddy Milling Co.	9.00	4.00	3.00	70.00
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EDEN, TEXAS.

1661A	Corn Chops.....	{	Fred Bros.	9.00	4.00	3.00	70.00
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EDNA, TEXAS.

1530A	Corn Chops.....	{	George F. Simons.	9.80	4.09	2.60	72.78
1530B	Milo Chops.....	{	Guarantee	10.00	2.50	3.00	70.50

EDWARDSVILLE, ILLINOIS.

959A	Wheat Bran.....	{	Edwardsville Milling Co.	14.00	3.50	10.00	54.00
959B	Wheat Middlings.....	{	Guarantee	16.00	4.00	5.00	56.00

EL CAMPO, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Extract.	Ingredients.	Remarks.
1863A 477	Prime Cottonseed Meal...	El Campo Cotton Oil Co.	Guarantee	44.00	7.00	11.00	24.00		
1863B	Prime Cottonseed Meal...		Found...	46.15	8.25	7.68	23.03		
	Prime Cottonseed Cake...		Guarantee	44.00	7.00	11.00	24.00		
451A	Rice Polish...	El Campo Rice Milling Co.	Guarantee	11.00	7.00	3.00	60.00		
49T	Rice Polish...		Found...	12.50	11.66	2.75	58.07		
451B	Rice Bran...		Guarantee	12.00	11.00	15.00	42.00		
48T	Rice Bran...		Found...	14.41	17.28	10.55	38.08		
68A	Corn Chops...	J. G. Moutray Elevator Co.	Guarantee	9.00	4.00	3.00	70.00		
68B	Corn Bran...		Guarantee	8.50	4.50	12.00	60.00		
68C	Short Horn Mixed Chops...		Guarantee	9.00	3.25	3.00	70.00	Kafir and corn chops.	
1846A	Corn Chops...	Isaac Weaver.	Guarantee	9.00	3.75	3.50	70.00		
1846B	Milo Chops...		Guarantee	10.00	2.50	3.00	70.50		
1436A	Corn Chops...	Wharton County Warehouse Co.	Guarantee	9.00	4.00	3.00	70.00		
1436B	Milo Chops...		Guarantee	9.00	2.50	3.50	70.00		
1436C	Kafir Chops...		Guarantee	9.00	3.00	2.50	70.00		
1436E	Mixed Chops...		Guarantee	9.00	3.25	3.00	70.00	Corn and kafir chops.	
1436F	Mixed Chops...		Guarantee	9.00	3.25	3.25	70.00	Corn and milo chops.	

EL CENTRO, CALIFORNIA.

1791A	Cottonseed Meal...	Imperial Valley Oil and Col- ton Co.	Guarantee	44.00	8.00	11.00	23.00		
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ELDORADO, TEXAS.

1557A	Milo Chops...	T. L. Benson..	Guarantee	9.50	2.50	3.00	71.00		
1567B	Milo Head Chops...		Guarantee	9.50	2.50	7.50	62.00		

838A	Milo Chops.....	J. F. & R. D. McKee.....	Guarantee	9.50	2.50	3.00	71.00
838B	Milo Head Chops.....		Guarantee	9.50	2.50	7.50	62.00
838C	Corn Chops.....		Guarantee	9.50	3.00	3.00	70.00
838C	Corn Chops.....		Found.....	10.88	5.19	2.07	69.36
1552A	Ground Kafir Heads.....	A. H. Parmer.....	Guarantee	9.00	2.50	7.00	68.00
1552B	Ground Milo Heads.....		Guarantee	9.50	2.50	7.50	62.00
1627A	Milo Chops.....	F. Ramsel.....	Guarantee	9.50	2.50	3.00	71.00

ELECTRA, TEXAS.

1316A	Corn Chops.....	Farmers Elevator Co.....	Guarantee	9.00	3.00	3.50	70.00
1316B	Milo Chops.....		Guarantee	9.50	2.50	3.00	71.00

ELGIN, TEXAS.

973A	Corn Chops.....	A. M. Clopton.....	Guarantee	9.00	4.00	3.00	70.00
1429A	Cottonseed Meal.....	Elgin Cotton Oil Co.....	Guarantee	44.00	7.00	11.00	24.00

ELIASVILLE, TEXAS.

2075A	Wheat Bran and Shorts.....	W. A. Andrews.....	Guarantee	15.00	3.50	10.00	50.00
2075A	Wheat Bran and Shorts.....		Found.....	19.59	2.78	7.38	55.88
795A	Wheat Bran.....	Donnell Brothers & Co.....	Guarantee	15.00	3.50	10.00	50.00
842A	Cottonseed Meal.....	Union Gin and Oil Co.....	Guarantee	44.00	8.00	11.00	24.00
842B	Cottonseed Cake.....		Guarantee	44.00	8.00	11.00	24.00

ELK CITY, OKLAHOMA.

472A	Cottonseed Meal.....	Elk City Cotton Oil Co....	Guarantee	44.00	7.00	11.00	23.00
472B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	23.00
57P	Cottonseed Cake.....		Found.....	39.65	5.34	14.14	27.87

Adulterated hulls.

ELK CITY, OKLAHOMA—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen Extract.	Ingredients.	Remarks.
2010A	Corn Chops.	Elk City Flour Mills Co...	Guarantee	9.00	3.50	3.00	70.00	.....	Adul. corn bran.
2010A	Corn Chops.		Found....	9.05	3.89	2.89	71.12	.....
2010B	Wheat Shorts.		Guarantee	17.00	3.50	4.50	60.00	.....
2010B	Wheat Shorts.		Found....	19.00	4.96	4.81	57.80	.....
2010C	Wheat Mixed Feed.		Guarantee	16.50	4.00	8.50	55.00	Wheat bran and shorts	
2010C	Wheat Mixed Feed.		Found....	17.87	4.46	9.14	51.88	.....
871A	Corn Chops.	Elk City Mill and Elevator Co.	Guarantee	9.00	4.00	3.00	70.00	.....
871B	Wheat Bran.		Guarantee	15.00	3.50	10.00	50.00	.....
871C	Kafir Chops.		Guarantee	10.98	3.12	2.75	71.18	.....
ELLINWOOD, KANSAS.									
1214A	Corn Chops.	Wolfe Milling Co.....	Guarantee	9.50	3.25	2.20	65.00	.....
1214B	Wheat Bran.		Guarantee	15.50	3.00	12.00	47.00	.....
1214C	Wheat Shorts.		Guarantee	17.50	4.00	6.00	54.00	.....
1214D	Wheat Mixed Feed.		Guarantee	17.50	3.25	8.25	51.00	Wheat bran and shorts	.....
1214E	Wheat Mixed Feed and Screenings.		Guarantee	17.00	3.25	8.00	50.00	Wheat bran, shorts and screenings	.....
1214F	Wheat Bran and Screenings		Guarantee	15.50	3.25	11.00	47.00	.....
1214G	Wheat Bran, Shorts and Screenings.		Guarantee	17.00	3.25	8.00	50.00	.....
ELLSWORTH, KANSAS.									
497A	Wheat Bran.	Ellsworth Mill Elevator Co.	Guarantee	14.50	3.50	10.00	50.00	.....
497B	Wheat Shorts.		Guarantee	17.25	4.40	5.00	60.00	.....

EL PASO, TEXAS.

1938A	Ainsa's Corn Chops.	M. Ainsa & Son, Inc.	Guarantee	9.00	3.50	3.00	70.00	
1938B	Wheat Bran.		Guarantee	15.00	3.50	9.50	55.00	
1938B	Wheat Bran.		Found....	14.38	3.63	7.19	60.37	
1363A	Chick Food.....		Guarantee	9.00	3.50	3.00	70.00	Cracked wheat, corn grit, millet seed, milo and kafir cracked, and charcoal.
1363B	Hen Food.....		Guarantee	11.00	2.56	3.00	70.00	Corn chops, wheat, kafir, milo and sunflower seed.
1363C	Corn Chops.....	R. B. Bias Fuel Co.	Guarantee	9.00	4.00	3.00	70.00	
1363D	Ground Oats.....		Guarantee	11.54	5.82	13.61	55.83	
1363E	Poultry Mash with Grit. ...		Guarantee	9.00	3.50	3.00	70.00	Wheat shorts, cottonseed, corn, meat meal, kafir, milo, millet, salt, grit and charcoal.
696A	Wheat Bran	El Paso Grain Co.	Guarantee	14.00	4.50	8.00	50.00	
696B	Corn Chops		Guarantee	9.00	4.00	3.00	70.00	
1123B	Corn Chops.....		Guarantee	9.00	4.00	3.00	70.00	
1123C	Corn Bran.....		Guarantee	9.80	6.20	11.20	62.20	
1123D	Mixed Bran, Shorts, and Screenings.		Guarantee	14.00	3.80	7.10	56.90	Wheat and corn bran, wheat shorts and screenings.
1123E	Peerless Hen Food.....		Guarantee	10.50	3.50	5.00	62.50	Corn chops, wheat, oats, milo, sunflower seed and wheat screenings
1123F	Globe A 1. Egg Mash Poultry Feed.	El Paso Grain and Milling Co.	Guarantee	19.56	6.71	7.14	50.34	Prepared household garbage, fish meal, ground milo, wheat bran and screenings.
1123F	Globe A 1. Egg Mash Poultry Feed.		Found....	24.22	4.18	7.15	48.05	
1123G	Globe A 1. Fish Meal.....		Guarantee	64.84	8.65	.50		
1123G	Globe A 1. Fish Meal.....		Found....	69.52	4.94	.56	.86	
1123H	Globe A 1. Household Garbage Mixed Feed.		Guarantee	16.70	3.75	12.20	37.43	Cooked vegetables and meat scraps
1123H	Globe A 1. Household Garbage Mixed Feed.		Found....	21.47	4.45	11.81	40.27	

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen.	Ingredients.	Remarks.
11231	Globe Mill Milo Chops.	El Paso Grain and Milling Co.—Continued.	Guarantee Found	10.00	2.50	3.00	70.50		
11231	Globe Mill Milo Chops.			11.44	2.89	2.10	73.95		
1911A	Cottonseed Meal.	El Paso Refining Co.	Guarantee Found	44.00	8.00	11.00	24.00		
1911B	Screened Cottonseed Cake.			44.00	8.00	11.00	24.00		
1880A	Cottonseed Cake.	Kraft and Madero.	Guarantee	44.00	8.00	11.00	24.00		
1942A	Wheat Bran.	J. Molinar Y Rey.	Guarantee	16.00	3.50	9.00	54.00		
1051A	Wheat Mixed Feed.	Lane & Lorentzen.	Guarantee	14.50	4.00	9.00	55.00	Wheat bran and shorts.	
1051B	Wheat Shorts.		Guarantee	15.00	3.00	5.00	60.00		
1051C	Wheat Bran.		Guarantee	14.50	3.00	10.00	55.00		
248A	Milo Chops.	Cecil Poff.	Guarantee Found	10.00	2.50	3.00	71.00		
2148A	Milo Chops.			10.13	2.87	2.09	72.27		
383A	Wheat Bran.	Runkle & Peacock.	Guarantee Found	14.00	4.50	10.00	50.00		
383B	Wheat Bran and Screenings			14.50	3.00	9.00	52.00		
1875A	Mixed Poultry Feed.	Santa Fe Fuel Co.	Guarantee	9.00	3.00	3.00	70.00	Corn chops, wheat, kafir and oats.	
1654A	Wheat Bran.	Schuster Commission Co.	Guarantee	14.50	4.75	8.48	58.70		
417A	Wheat Bran.	H. Seggerman.	Guarantee	14.00	3.00	10.00	50.00		
1571A	Wheat Bran.	Western Grocery Co.	Guarantee	14.50	3.50	10.00	52.00		
1418A	Cottonseed Meal.	West Texas Fuel Co.	Guarantee	44.00	7.00	9.00	23.00		

1600A	Alfalfa Meal.....	Guarantee	13.50	1.50	30.00	35.00	Cracked corn, wheat, kafir, milo,
1600D	Perfection Hen Food.....	Guarantee	10.00	4.00	6.00	60.00	oats, barley and sunflower seed.
1600E	Perfection Mash with Charcoal.	Guarantee	18.00	4.00	9.00	45.00	Wheat middlings, corn and cottonseed meal, wheat bran, beef scraps,
1600F	Perfection Chick Food with Grit and Charcoal.	Guarantee	10.00	3.50	4.00	60.00	ground oats, alfalfa and charcoal.
							Wheat, corn and milo cracked, millet, hemp, charcoal and grit.

W. D. Wise Feed Co.....

EL RENO, OKLAHOMA.

244A	Corn Chops.....	Guarantee	9.00	4.97	3.47	70.38	.....
244C	Wheat Shorts.....	Guarantee	16.50	4.00	5.00	60.00	.....
244E	Wheat Mixed Feed and Screenings.	Guarantee	15.24	4.35	8.31	54.28	Wheat bran, shorts and screenings.
244F	Wheat Bran and Screenings	Guarantee	14.50	3.50	9.00	52.50	.....
244G	Little Brown Hen Chick Feed with Grit, Charcoal and Granulated Bone.	Guarantee	12.00	3.60	3.50	65.00	Cracked wheat, kafir and milo, corn meal, millet seed, granulated bone, charcoal and grit.
244H	Little Brown Hen Scratch Feed.	Guarantee	11.00	3.60	4.00	65.00	Wheat, kafir, milo, oats and cracked corn.
1200A	Alfalfa Meal.....	Guarantee	13.00	1.50	35.00	28.00	.....
1200B	Alfalfa Mixed Feed.....	Guarantee	13.50	2.50	16.00	52.00	Corn chops, crushed oats, alfalfa meal and salt.
1200C	Cow Falfa.....	Guarantee	16.50	3.25	20.00	48.00	Alfalfa and cottonseed meal, wheat bran and corn chops.
1200D	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	.....
1200E	White Wolfe Feed.....	Guarantee	10.00	2.50	16.00	50.00	Alfalfa meal and corn chops.
108A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	.....
108B	Wheat Bran and Screenings	Guarantee	14.50	3.50	10.00	50.00	.....
108C	Standard Wheat Shorts.....	Guarantee	15.00	3.50	5.00	60.00	.....

Canadian Mill and Elevator Co.

El Reno Alfalfa Milling Co.

El Reno Mill and Elevator

EMPORIA, KANSAS.

1922A	Corn Chops.....	Guarantee	9.00	3.50	3.00	65.00
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City Mill and Elevator Co.

ENID, OKLAHOMA.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen + Phos- phor.	Ingredients.	Remarks.
302A	Corn Chops.....	Enid Mill and Elevator Co.	Guarantee	9.00	3.50	3.00	70.00	.....
302B	Wheat Bran.....		Guarantee	17.00	3.00	9.00	53.00	.....
302 C	Wheat Shorts.....		Guarantee	15.00	4.00	4.50	60.00	.....
302D	Mixed Feed.....		Guarantee	12.45	3.00	5.20	63.95	Wheat bran and kafir chops	
302E	Mixed Feed.....		Guarantee	9.90	3.50	2.53	76.57	Corn and kafir chops	
302F	Wheat Bran.....		Guarantee	15.00	3.00	9.00	53.00	.....
302G	Wheat Mixed Feed.....	Farmers Mill and Elevator Co.	Guarantee	15.00	4.50	9.00	56.00	Wheat bran and shorts	
549A	Wheat Mixed Feed.....		Guarantee	15.00	3.40	10.00	50.00	Wheat bran and shorts	
549B	Corn Chops.....		Guarantee	9.00	4.00	3.00	70.00	.....
1022A	Wheat Mixed Feed.....	Garfield County Milling Co.	Guarantee	15.00	3.50	10.00	50.00	Wheat bran and shorts	

ENNIS, TEXAS.

1421A	Corn Chops.....	City Mill.	Guarantee	9.00	3.50	3.00	70.00	.....
1421E	Corn Chops and Corn Bran		Guarantee	9.00	3.00	3.50	70.00	.....
1421F	Mixed Feed.....		Guarantee	14.50	3.00	10.00	50.00	Wheat and corn bran	
1421G	Wheat Mixed Feed.....		Guarantee	14.50	3.50	10.00	50.00	Wheat bran and shorts	
1421H	Milo Chops.....		Guarantee	9.50	2.50	3.00	71.00	.....
1421I	Wheat Shorts.....		Guarantee	15.00	3.50	5.00	60.00	.....
1421K	Wheat Bran and Screenings	City Mill.	Guarantee	14.00	3.50	8.50	50.00	.....
1421L	Mixed Bran and Screenings		Guarantee	14.00	3.00	10.00	50.00	Corn bran, wheat bran and screen- ings.	
1421M	Mixed Feed.....		Guarantee	9.00	2.75	4.00	70.00	Milo and cane seed chops and corn bran.	
1421O	Corn Bran and Corn Screen- ings.	City Mill.	Guarantee	9.00	4.50	8.50	64.75	.....
1421O	Corn Bran and Corn Screen- ings.		Found.....	10.94	7.80	9.04	60.24	.....

1421P	Mixed Bran and Screenings	Guarantee	12.00	4.25	9.50	58.50	Wheat bran, corn bran and wheat screenings.
1421P	Mixed Bran and Screenings	Found....	14.44	5.76	8.80	54.14	
1421Q	Chick Food.....	Guarantee	11.00	2.75	3.00	70.00	Milo, corn, wheat, cane seed chops.
1421Q	Chick Food.....	Found....	11.13	3.02	2.78	69.26	
324A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	23.00	
64B	Cottonseed Meal.....	Found....	44.48	6.97	9.46	25.83	
324B	Cottonseed Cake.....	Guarantee	44.00	7.00	11.00	23.00	
324C	Cottonseed Hulls and Meal	Guarantee	10.00	2.00	41.00	35.00	
65B	Cottonseed Hulls and Meal	Found....	9.53	2.07	43.19	32.44	
324D	Cottonseed Meal and Hulls	Guarantee	39.00	7.00	12.00	29.00	

Ennis Cotton Oil Co.....

ENTERPRISE, KANSAS.

1212A	Corn Chops.....	Guarantee	9.00	3.50	3.50	70.00	
1212B	Wheat Bran.....	Guarantee	14.50	3.50	10.00	50.00	

C. Hoffman & Son Milling Co.

ERICK, OKLAHOMA.

806A	Wheat Mixed Feed.....	Guarantee	14.50	3.50	10.00	50.00	Wheat bran and shorts.
806B	Corn Chops.....	Guarantee	10.00	4.00	3.06	67.50	

Erick Milling Co.....

ESTELLINE, TEXAS.

1569A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	
1569B	Milo Head Chops.....	Guarantee	8.50	2.25	7.50	65.00	
1569C	Corn and Cob Meal.....	Guarantee	7.75	3.25	6.25	65.00	
1054A	Corn Chops.....	Guarantee	8.90	3.90	2.90	69.90	
1697A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	
858A	Corn Chops.....	Guarantee	8.90	3.90	2.90	69.00	
858B	Milo Chops.....	Guarantee	8.90	2.45	3.45	69.90	
164B	Kafir Chops.....	Guarantee	12.00	3.00	2.75	69.32	

John R. Barnes.....

Esteline Milling Co.....

O. K. Mill and Grain Co.....

W. M. Stout & Son.....

Vardy Brothers.....

EUPAULA, OKLAHOMA.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen Extract.	Ingredients.	Remarks.
48A	Corn Chops.....	Eufaula Elevator and Grain Co.	Guarantee	9.00	3.50	3.00	70.00	.....	.....

EVANSVILLE, ILLINOIS.

114A	Wheat Bran.....	Sauers Milling Co.	Guarantee	14.26	3.21	8.80	55.18	.....	.....
114B	Wheat Shorts.....		Guarantee	14.96	4.20	8.80	60.10	.....	.....

EVERTON, MISSOURI.

1324A	Mixed Feed.....	Wm. Raubinger.....	Guarantee	14.00	3.65	10.00	52.00	Wheat and corn bran and re-cleaned wheat screenings.	.....
1324B	Wheat Mixed Feed.....		Guarantee	15.00	3.50	10.00	50.00	Wheat bran and shorts.	.....
1324C	Corn Chops.....		Guarantee	9.00	4.00	3.00	70.00	.....	.....
1324D	Wheat Shorts.....		Guarantee	15.00	4.00	6.00	60.00

FANNIN, TEXAS.

1952A	Corn Chops.....	Fannin Mill.....	Guarantee	9.00	3.50	3.00	70.00
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FAIRLAND, OKLAHOMA.

1068A	Corn Chops.....	Gains Brothers.....	Guarantee	9.00	4.00	3.00	70.00
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FAIRVIEW, OKLAHOMA.

134A	Wheat Bran.....	Fairview Milling Co.	Guarantee	17.56	3.86	8.42	54.05
134B	Corn Chops.....		Guarantee	9.60	3.90	2.52	71.71	.....	.....
134C	Wheat Bran.....		Guarantee	14.50	3.50	10.00	50.00	.....	.....

FALLS CITY, TEXAS.

'4B	Unbolted Corn Meal.....	Schultz Gin and Milling Co.	{	Guarantee	9.25	3.91	2.52	71.71	
'4C	Corn Chops.....		{	Guarantee	9.25	3.91	2.52	71.71	

FARMERSVILLE, TEXAS.

01A	Cottonseed Meal.....	Farmers Cotton Oil Co.....	{	Guarantee	44.00	7.00	11.00	24.00	Adaltereded hulls.
60Y	Cottonseed Meal.....		{	Found....	43.13	6.71	12.04	24.85	
01B	Perfecto Mixed Feed.....		{	Guarantee	10.50	3.00	40.00	30.00	
59Y	Perfecto Mixed Feed.....		{	Found....	11.06	2.13	40.04	33.36	
01C	Screened Cottonseed Cake..		{	Guarantee	44.00	7.00	11.00	24.00	
84B	Wheat Bran and Shorts.....	Farmersville Mill and Light Co.	{	Guarantee	14.50	3.50	10.00	50.00	Wheat, bran, shorts and screenings.
84C	Wheat Shorts.....		{	Guarantee	15.00	4.00	5.00	55.00	
84E	Corn Chops and Corn Bran		{	Guarantee	8.75	3.50	3.50	69.50	
84F	Wheat Mixed Feed and Screenings.		{	Guarantee	14.50	3.50	10.00	50.00	
84G	Milo Chops.....		{	Guarantee	10.00	2.50	3.00	70.50	
84H	Mixed Bran and Wheat Screenings.		{	Guarantee	14.50	3.50	9.00	50.00	Wheat and corn bran and wheat screenings.
84H	Mixed Bran and Wheat Screenings.		{	Found....	15.69	4.26	7.57	56.88	

FLATONIA, TEXAS.

20A	Corn Chops and Corn Meal	G. S. Eigelbach.....	{	Guarantee	9.60	3.90	2.52	71.71	
20B	Corn Chops.....		{	Guarantee	9.00	3.00	3.50	70.00	
17A	Cottonseed Meal.....	Flatonia Oil Mill.....	{	Guarantee	44.00	9.00	11.00	24.00	
2T	Cottonseed Meal.....		{	Found....	43.37	8.63	6.95	23.54	

FLEETWOOD, OKLAHOMA.

34A	Corn Chops.....	Walker and Brice.....	{	Guarantee	9.00	4.00	3.00	70.00	
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FLORENCE, TEXAS.

94A	Corn Chops.....	Florence Mill Co.....	{	Guarantee	9.00	3.50	3.00	70.00	
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FLORESVILLE, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen.	Ingredients.	Remarks.
37A	Cottonseed Meal.....	Floresville Oil and Manufacturing Co.	Guarantee	44.00	8.00	11.00	24.00	.....	.....
37B	Corn Bran.....		Guarantee	8.00	4.00	11.00	60.00	.....	.....
54A	Ear Corn Chops without Shucks.	Houston-Lichnovsky Gin Co.	Guarantee	9.00	2.50	7.50	70.00	Corn chops, ground corn cob.....	.....
05A	Ear Corn Chops without Shucks.		Found.....	10.25	2.72	8.53	66.65	.....	.....
05B	Corn Chops.....		Guarantee	9.50	3.50	3.00	70.00	.....	.....
05B	Corn Chops.....		Found.....	10.69	3.78	2.67	70.66	.....	.....
93T	Ear Corn Chops without Shucks.		Found.....	10.25	3.42	7.00	66.87	.....	.....
78A	Corn Chops.....	H. Knuth.....	Guarantee	9.00	4.00	3.00	70.00	.....	.....
78B	Corn Bran.....		Guarantee	9.00	4.50	11.00	60.00	.....	.....

FLOYDADA, TEXAS.

19A	Milo Chops.....	Edwards Grain and Elevator Co.	Guarantee	10.00	2.50	3.00	70.50	.....	.....
56A	Milo Chops.....	Marshall Grain Co.....	Guarantee	9.00	2.50	3.00	67.00	.....	.....
56B	Crushed Milo Heads.....		Guarantee	9.00	2.50	7.00	64.00	.....	.....

FLUVANNA, TEXAS.

22A	Milo Head Chops.....	Morland & Stephenson.....	Guarantee	9.50	2.50	7.50	62.00	.....	.....
71A	Corn Chops.....	J. I. Parker.....	Guarantee	9.00	3.50	3.50	70.00	.....	.....

FORNEY, TEXAS.

60A	Prime Cottonseed Meal....	Guarantee	45.00	6.00	9.00	24.00	
5Y	Prime Cottonseed Meal....	Found....	45.05	6.34	10.37	26.27	
60B	Jersey Feed.....	Guarantee	11.00	2.90	40.00	35.00	Cottonseed meal and hulls....
60C	Prime Cottonseed Cake.....	Guarantee	45.00	6.00	9.00	24.00	
60D	Horse Feed.....	Guarantee	13.00	3.00	36.00	35.00	Cottonseed hulls and meal....
60E	Cottonseed Meal and Hulls	Guarantee	40.00	6.00	11.75	28.00	
60E	Cottonseed Meal and Hulls	Found....	42.32	6.90	11.51	26.10	

Forney Cotton Oil and Gin Co.

FORRESTON, TEXAS.

09A	Corn Chops.....	Guarantee	9.00	3.50	3.50	70.00	
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FORT COLLINS, COLORADO.

73A	Wheat Mixed Feed.....	Guarantee	14.50	3.50	10.00	50.00	Wheat bran and shorts....
81P	Wheat Mixed Feed.....	Found....	15.81	4.22	7.95	56.24	

FORT SCOTT, KANSAS.

15A	Mixed Feed.....	Guarantee	16.58	4.20	10.96	58.59	Wheat bran, shorts and grain screenings....
15B	Wheat Shorts.....	Guarantee	16.56	5.11	4.50	57.84	

FORT STOCKTON, TEXAS.

78A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	
78B	Corn and Milo Chops.....	Guarantee	8.50	2.75	3.00	71.00	

FORT WORTH, TEXAS.

08A	Bell Brand Chick Food....	Guarantee	8.75	3.00	2.75	68.00	Kafir, milo, wheat, corn chops and millet....
08A	Bell Brand Chick Food....	Found....	11.41	2.50	2.75	72.73	
41A	Poultry Bone.....	Guarantee	25.00	.50			
41B	Meat and Bone.....	Guarantee	50.00	8.00			
41C	Meat Meal.....	Guarantee	60.00	10.00			

Armour Fertilizer Works..

FORT WORTH, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Ex- tract.	Ingredients.	Remarks.
541D	Beef Scraps.....	Armour Fertilizer Works Continued	Guarantee	55.00	10.00				
541E	Blood Meal.....		Guarantee	75.00					
541F	Feeding Tankage.....		Guarantee	42.00	10.00				
4A	Corn Chops.....		Guarantee	9.00	3.00	3.50	70.00		
4C	Wheat Shorts.....		Guarantee	15.00	3.50	4.00	60.00		
4D	Kafir Chops.....		Guarantee	9.50	2.75	3.00	71.00		
4E	Corn and Kafir Chops.....		Guarantee	9.00	3.00	3.00	71.00		
4G	Mixed Bran and Screenings.		Guarantee	14.00	3.80	7.10	56.90	Corn and wheat bran and screen- ings.	
4H	Corn Chops and Corn Bran		Guarantee	9.00	3.00	3.50	70.00		
4I	Mixed Chops and Corn Bran		Guarantee	9.00	3.00	3.00	70.00	Corn and kafir chops and corn bran.	
4J	Anchor Mixed Bran Shorts and Screenings.		Guarantee	14.00	3.80	7.10	56.90	Wheat and corn bran, shorts and screenings.	
8S	Anchor Mixed Bran Shorts and Screenings.	Bewely Mills.....	Found....	15.83	4.34	8.30	55.50		Adul. screenings.
4K	Little Chick Food.....		Guarantee	10.80	2.80	2.50	68.30	Wheat, milo, cane and corn cracked	
4L	Blue Ribbon Hen Food with Grit.		Guarantee	10.00	2.40	2.20	62.40	Corn chops, wheat, milo, kafir, oat and grit.	
4M	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.00		
4N	Milo and Corn Chops.....		Guarantee	9.50	3.00	3.00	70.25		
4O	Mixed Feed.....		Guarantee	12.00	2.75	5.00	71.00	Milo and kafir chops and wheat bran.	
75A	Corn Chops.....	Burrus Mill and Elevator Co.	Guarantee	9.00	3.50	2.39	70.82		
75B	Wheat Bran.....		Guarantee	15.50	3.50	10.00	54.00		
75C	Wheat Shorts.....		Guarantee	15.00	4.00	5.00	56.00		
75D	Corn Chops and Corn Bran		Guarantee	9.00	3.50	2.39	70.82		
75E	Mixed Bran.....		Guarantee	15.00	3.50	10.00	50.00	Wheat and corn bran	
75F	Wheat Bran and Screenings		Guarantee	15.00	3.50	10.00	54.00		

75G	Milo and Corn Chops.....	Guarantee	9.50	3.50	3.00	70.00	.....
75G	Milo and Corn Chops.....	Found....	10.31	3.34	2.60	72.45	.....
75H	Milo Chops and Wheat Bran	Guarantee	14.00	4.00	6.00	60.00	.....
75H	Milo Chops and Wheat Bran	Found....	14.44	3.81	5.78	63.20	.....
75I	Milo Chops.....	Guarantee	10.00	3.00	2.50	68.00	.....
75I	Milo Chops.....	Found....	11.06	2.87	2.48	71.84	.....
077A	A B C Mixed Feed.....	Guarantee	12.00	3.00	13.50	58.00	Corn chops, wheat bran, alfalfa meal and mill screenings.
077B	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	.....
077C	Kafir Chops.....	Guarantee	9.50	2.75	3.00	71.00	.....
077D	Mixed Chops.....	Guarantee	9.50	3.50	3.00	70.00	Kafir and corn chops.
077E	Mixed Chops.....	Guarantee	9.25	3.00	3.50	68.00	Corn and milo chops.
077F	Mixed Feed.....	Guarantee	12.00	3.00	7.00	61.00	Wheat bran and milo chops.
077G	Milo Chops.....	Guarantee	9.50	2.50	3.00	71.00	.....
077G	Milo Chops.....	Found....	12.69	3.67	2.00	67.88	.....
077I	A B C Horse and Mule Feed	Guarantee	11.00	1.65	14.00	55.00	Alfalfa meal, milo chops, wheat bran and molasses.
077J	Red Cross Molasses Mixed Feed.	Guarantee	10.34	2.86	12.00	55.60	Alfalfa meal, oats, molasses and ground milo.
71P	Red Cross Molasses Mixed Feed.	Found....	10.19	1.47	9.15	60.14	.....
2Y	Red Cross Molasses Mixed Feed.	Found....	10.56	1.79	12.00	58.29	.....
077K	Golden Rod Mixed Feed...	Guarantee	11.00	2.50	14.00	40.00	Alfalfa meal, corn chops, wheat bran and molasses.
3Y	Golden Rod Mixed Feed...	Found....	9.57	1.02	11.39	58.69	.....
9P	Golden Rod Mixed Feed...	Found....	10.35	1.18	8.04	58.96	.....
077L	Alamo Stock Feed.....	Guarantee	8.00	.75	17.00	50.00	Alfalfa meal and molasses.
077N	Alamoats Mixed Feed.....	Guarantee	9.50	2.00	18.50	50.00	Oats, alfalfa meal and molasses.
077N	Alamoats Mixed Feed.....	Found....	9.14	.69	10.31	54.67	.....
077O	Golden Rod Poultry Food...	Guarantee	10.97	3.09	3.48	65.18	Milo, wheat, corn chops.
077O	Golden Rod Poultry Food...	Found....	10.94	2.53	2.62	71.26	.....
077P	Red Cross Special Mixed Feed.	Guarantee	12.46	3.11	10.59	60.23	Corn chops, oats, alfalfa meal and molasses.
077P	Red Cross Special Mixed Feed.	Found....	9.82	1.83	11.63	59.54	.....
077Q	Milo Head Chops.....	Guarantee	9.18	3.00	6.55	66.19	.....
077Q	Milo Head Chops.....	Found....	10.67	2.81	10.06	63.19	.....

Crouch Grain Co.

FORT WORTH, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen Extract.	Ingredients.	Remarks.
1077R	Old Joe Molasses Mixed Feed.	Crouch Grain Co.—Cont'd	Guarantee	8.00	1.75	17.00	50.00	Milo head chops, oat clippings and molasses.	
1077R	Old Joe Molasses Mixed Feed.		Found.....	6.97	.90	7.37	62.20		
1077S	Good Luck Molasses Mixed Feed.		Guarantee	8.50	1.25	13.65	52.00	Milo head chops, ground milo head straw, alfalfa meal and molasses.	
1077S	Good Luck Molasses Mixed Feed.		Found.....	8.63	1.00	11.53	58.87		
1077T	Milo Lass Mixed Feed.....		Guarantee	10.00	3.01	8.00	67.00	Ground milo heads and molasses.	
1077T	Milo Lass Mixed Feed.....		Found.....	10.50	1.99	4.87	68.08		
51B	Milo Lass Mixed Feed.....		Found.....	10.00	2.48	5.13	66.59		
73P	Milo Lass Mixed Feed.....		Found.....	9.19	1.69	7.73	63.93		
1077U	Blue Ribbon Molasses Mixed Feed.		Guarantee	9.00	2.86	8.00	65.00	Ground milo head and molasses.	
1077U	Blue Ribbon Molasses Mixed Feed.		Found.....	8.56	1.61	7.46	65.82		
1077V	Milo Lass Mixed Feed No. 2	Crystal Ice Co.....	Guarantee	8.01	1.87	9.00	58.00	Milo head chops, ground milo head straw and molasses.	
1077V	Milo Lass Mixed Feed No. 2		Found.....	7.16	1.67	9.66	63.42		
1077W	Alfalfa Meal.....		Guarantee	12.00	1.25	30.00	36.00		
1077W	Alfalfa Meal.....		Found.....	12.00	1.25	30.00	36.00		
1925A	Milo and Kafir Head Chops.....	Crystal Ice Co.....	Guarantee	9.45	2.37	7.35	65.25		
642A	Corn Chops.....	Dazey Moore Grain Co.....	Guarantee	9.00	4.00	3.50	68.00		
516A	Cottonseed Meal.....	Port Worth Cotton Oil Mill	Guarantee	45.00	6.00	11.00	24.00		
11P	Cottonseed Meal.....		Found.....	47.17	6.10	8.88	24.91		
72P	Cottonseed Meal.....		Found.....	44.69	7.59	9.68	25.65		
94R	Cottonseed Meal.....		Found.....	43.04	8.89	10.97	25.55		
516B	Cottonseed Cake.....		Guarantee	45.00	6.00	11.00	24.00		
32P	Cottonseed Cake.....		Found.....	43.32	5.29	11.66	26.64		Adulterated hulls.

Grade	Sample	Found	43.13	5.43	12.34	25.62	Adulterated hulls.
1P	Cottonseed Cake	Found	43.13	5.43	12.34	25.62	
19R	Cottonseed Cake	Found	43.67	5.49	10.69	26.96	
6C	Panther Cow Feed	Guarantee	10.00	2.00	40.00	30.00	Cottonseed hulls and meal
6D	Corn Chops	Guarantee	9.00	3.50	3.00	70.00	
6E	Cottonseed Meal and Hulls	Guarantee	38.00	5.00	14.00	24.00	
6E	Cottonseed Meal and Hulls	Found	37.25	5.53	13.46	30.50	
10A	Corn Chops	Guarantee	9.00	3.00	3.50	70.00	
10B	Wheat Mixed Feed	Guarantee	14.50	3.50	10.00	50.00	Wheat bran and shorts
10C	Wheat Bran	Guarantee	14.50	3.50	10.00	52.00	
10D	Wheat Shorts	Guarantee	16.00	4.00	5.00	60.00	
10E	Mixed Chops	Guarantee	9.00	3.50	3.00	70.00	Corn and milo chops
10F	Milo Chops	Guarantee	9.00	2.50	3.75	70.00	
10G	Kafir Chops	Guarantee	9.50	2.75	3.00	71.00	
10H	Argentine Wheat Shorts, Bran and Screenings	Guarantee	16.00	4.00	7.00	54.00	
17A	Cottonseed Meal	Guarantee	44.00	7.00	11.00	24.00	
13P	Cottonseed Meal	Found	42.85	8.07	11.80	25.47	
11B	Cottonseed Meal	Found	41.25	6.46	13.15	26.66	Adulterated hulls.
12R	Cottonseed Meal	Found	38.55	7.16	14.25	26.93	Adulterated hulls.
13R	Cottonseed Meal	Found	39.00	7.41	13.86	27.02	Adulterated hulls.
17B	Cottonseed Cake	Guarantee	44.00	7.00	11.00	24.00	
10P	Cottonseed Cake	Found	37.59	7.70	12.53	27.06	Adulterated hulls.
17C	Cottonseed Meal and Hulls	Guarantee	42.00	6.00	12.00	24.00	
17C	Cottonseed Meal and Hulls	Found	40.59	6.36	13.16	27.01	
17D	Cottonseed Cake and Hulls	Guarantee	42.00	6.00	12.00	24.00	
17D	Cottonseed Cake and Hulls	Found	43.98	4.94	11.00	26.92	
17E	Mixed Cottonseed Meal and Hulls	Guarantee	31.00	5.00	30.00	23.00	
17E	Mixed Cottonseed Meal and Hulls	Found	30.10	7.93	17.14	31.18	
14A	Milo Head Chops	Guarantee	9.75	2.40	7.50	65.00	
14A	Milo Head Chops	Found	7.96	2.33	7.45	67.30	
17A	Mchul Mixed Cottonseed Meal and Hulls	Guarantee	10.50	3.00	40.00	30.00	
17B	Cottonseed Meal	Guarantee	44.00	7.00	11.00	24.00	

FORT WORTH, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
95R 97C	Cottonseed Meal..... Cottonseed Cake.....	Mutual Cotton Oil Co.— Continued	Found..... Guarantee	43.00 44.00	7.57 7.00	10.20 11.00	26.23 24.00	..........	..........
99A 99B 99C	Corn Chops..... Milo Chops..... Lone Star Mixed Feed No. 1		Guarantee Guarantee Guarantee	9.00 9.00 10.50	3.50 2.75 1.25	3.00 3.00 15.00	70.00 68.00 50.00	..... ..... Alfalfa meal, corn chops and molasses.	..... ..... .....
99D	Lone Star Mixed Feed No. 3		Guarantee	10.25	1.75	12.00	55.00	Milo chops, oats, molasses and alfalfa meal.	.....
1Y 12P 99E	Lone Star Mixed Feed No. 3 Lone Star Mixed Feed No. 3 Lone Star Mixed Feed No. 2	Panther City Grain Co....	Found..... Found..... Guarantee	8.34 9.69 10.25	.96 1.62 1.25	12.87 12.24 12.00	57.18 58.02 55.00	..... ..... Wheat bran, milo, alfalfa meal and molasses.	..... ..... .....
99F	Molasses Mixed Milo Head Chops.		Guarantee	9.40	2.35	7.25	55.50	.....	.....
33A 33B 33C 10P 33D	Cold Pressed Cottonseed.... Screened Cottonseed Cake Cottonseed Meal..... Cottonseed Meal..... Riverside Mixed Feed.....	Riverside Cotton Oil Co..	Guarantee Guarantee Guarantee Found..... Guarantee	29.00 44.00 44.00 47.76 10.00	6.30 7.00 7.00 7.32 2.00	25.00 11.00 11.00 8.53 40.00	28.00 24.00 24.00 24.31 30.00	..... ..... ..... ..... Cottonseed hulls and meal.	..... ..... ..... ..... .....
16A 16B	Cottonseed Meal..... Cottonseed Cake.....	M. Sansom & Co.....	Guarantee Guarantee	44.00 44.00	7.00 7.00	11.00 11.00	24.00 24.00	..........	..........
73A 73B 73C 73D 73E 73F	Panther Corn Chops..... Kafir Chops..... Mixed Chops..... Mixed Chops..... Wheat Mixed Feed..... Wheat Shorts.....	Smith Brothers Grain Co..	Guarantee Guarantee Guarantee Guarantee Guarantee Guarantee	9.25 9.00 9.00 15.50 16.00	3.75 3.00 3.50 3.50 3.50	3.50 3.00 3.00 10.00 6.00	70.00 70.00 70.00 70.00 60.00	..... ..... Kafir and corn chops..... Milo and corn chops..... Wheat bran and shorts.	..... ..... ..... ..... ..... .....

473G	Wheat Bran.....	Guarantee	15.00	3.50	10.00	50.00	.....	.....
473H	Panther Brand A Stock Feed	Guarantee	10.00	3.50	14.00	56.00	Corn chops, alfalfa meal and mill screenings.	.....
473I	Mixed Feed.....	Guarantee	13.00	6.50	8.50	50.00	Wheat shorts and rice bran.....	.....
473J	Longhorn Mixed Chops.....	Guarantee	9.00	3.50	3.00	70.00	Corn, milo, kafir chops.....	.....
473K	B. K. S. Mixed Feed.....	Guarantee	11.00	3.00	4.50	67.00	Milo and kafir chops and wheat bran	.....
270A	Swift's Digester Tankage.....	Guarantee	60.00	6.00	3.00	.....	.....	.....
270B	Blood Flour.....	Guarantee	80.00	.....	3.00	.....	.....	.....
270C	Blood Meal.....	Guarantee	80.00	.....	3.00	.....	.....	.....
270E	Swift's Beef Meal.....	Guarantee	45.00	5.00	3.00	3.00	.....	.....
270F	Beef Scraps.....	Guarantee	60.00	8.00	1.00	3.00	.....	.....
270G	Swift's Ideal Poultry Feed.....	Guarantee	53.00	7.00	3.00	3.00	Beef scraps and bone.....	.....
270H	Swift's Meat Scraps.....	Guarantee	50.00	8.00	3.00	.....	.....	.....
66T	Swift's Meat Scraps.....	Found.....	59.70	11.20	3.94	.21	.....	.....
960A	Corn Chops.....	Guarantee	9.00	4.00	3.00	68.00	.....	.....
960B	Wheat Bran.....	Guarantee	14.50	4.00	9.50	53.50	.....	.....
960D	Milo Chops.....	Guarantee	10.00	2.40	2.85	71.50	.....	.....
960E	Kafir Chops.....	Guarantee	10.00	2.40	2.85	71.50	.....	.....
960F	Corn and Kafir Chops.....	Guarantee	9.50	2.90	3.00	70.50	.....	.....
611A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	.....	.....
611B	Mixed Chops.....	Guarantee	9.00	4.00	3.00	70.00	Corn and kafir chops.....	.....
611C	Mixed Feed.....	Guarantee	12.00	3.00	6.00	60.00	Kafir and wheat bran.....	.....
611D	Mixed Feed.....	Guarantee	11.00	3.00	5.00	65.00	Milo chops and wheat bran.....	.....
1853B	Wheat Bran and Screenings.....	Guarantee	15.00	3.00	10.00	52.00	.....	.....
1971A	Milo, Kafir and Peterita Head Chops.....	Guarantee	9.50	2.25	7.50	65.00	.....	.....

FRANKLIN, TEXAS.

868A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	.....	.....
2041A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	.....	.....
2041A	Corn Chops.....	Found.....	9.50	4.25	2.43	71.60	.....	.....

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen.	Ingredients.	Remarks.
576A	Corn Chops.....	Cox Campbell Grain Co.....	Guarantee	9.00	4.00	3.00	70.00	.....
FREDERICKSBURG, TEXAS.									
1803A	Wheat Bran and Shorts.....	Reliance Roller Mill.....	Guarantee	14.55	3.00	8.50	55.00	.....
106T	Wheat Bran and Shorts.....		Found. . . .	17.04	4.54	8.52	54.91	.....
1803B	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....
1803C	Wheat Chops.....		Guarantee	14.00	1.75	4.00	65.00	.....
1803D	Corn Bran.....		Guarantee	8.55	3.50	12.00	58.00	.....
FREEBURG, ILLINOIS.									
780A	Wheat Middling.....	Reichert Milling Co.....	Guarantee	16.00	4.00	5.00	56.00	.....
780B	Winter Wheat Bran.....		Guarantee	14.50	3.50	10.00	50.00	.....
FRISCO, TEXAS.									
925A	Corn Chops.....	Frisco Grain and Elevator Co.	Guarantee	9.00	3.75	3.00	65.00	.....
228A	Corn Chops.....	Frisco Milling Co.....	Guarantee	9.00	3.50	3.00	70.00	.....
228B	Wheat Bran.....		Guarantee	14.50	3.00	10.00	55.00	.....
228C	Mixed Feed.....		Guarantee	8.50	3.50	5.00	65.00	Wheat bran and corn meal.	
228D	Mixed Chops.....		Guarantee	9.00	3.00	3.00	70.00	Kafir and corn chops.	
228E	Wheat Shorts.....		Guarantee	14.00	3.00	4.00	60.00	.....
1251A	Corn Chops.....	Mitchell & Sledge.....	Guarantee	9.00	3.00	3.50	70.00	.....
FROST, TEXAS.									
442A	Cottonseed Meal.....		Guarantee	44.00	7.00	11.00	20.00	.....
442B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	20.00	.....

42C	Cottonseed Meal and Hulls	Planters Cotton Oil Co.	Guarantee	37.00	6.00	18.00	23.00
42C	Cottonseed Meal and Hulls		Found.	41.51	7.72	12.42	24.87
68B	Cottonseed Meal and Hulls		Found.	41.57	6.67	12.17	25.64
442D	Cottonseed Cake and Hulls		Guarantee	37.00	6.00	18.00	23.00
442D	Cottonseed Cake and Hulls		Found.	45.25	6.28	9.67	25.04
1584A	Corn Chops.	Planters Gin Co.	Guarantee	9.00	3.50	3.00	70.00

GAGE, OKLAHOMA.

1311A	Wheat Mixed Feed.		Guarantee	15.05	3.00	7.00	59.00	Wheat bran and shorts.
1311B	Corn Chops.		Guarantee	9.00	3.50	3.50	70.00	
1311C	Kafir Chops.		Guarantee	11.56	2.45	2.38	68.83	
1311D	Milo Chops.		Guarantee	10.25	3.45	2.25	72.00	
1311E	Wheat Shorts.	Gage Roller Mills.	Guarantee	16.00	3.50	5.00	54.00	
1311F	Wheat Bran		Guarantee	16.20	3.73	8.57	54.69	
1311G	Mixed Feed and Screenings.		Guarantee	15.00	3.00	8.00	55.00	Wheat bran, corn bran and screenings.
1321A	Corn Chops.	Green and Wright.	Guarantee	9.00	3.50	3.50	70.00	
1321B	Kafir Chops.		Guarantee	10.26	3.02	2.16	27.58	

GAINESVILLE, TEXAS.

1425A	Soxet Mixed Stock Feed.		Guarantee	9.85	2.75	40.00	34.00	Cottonseed hulls and meal.
1425B	Cottonseed Cake.		Guarantee	44.00	7.07	11.00	20.00	
14P	Cottonseed Cake.		Found.	43.32	7.27	11.69	25.26	Adulterated hulls.
1425C	Cottonseed Meal	Gainesville Cotton Oil Co.	Guarantee	44.00	7.00	11.00	20.00	
38R	Cottonseed Meal		Found.	44.85	7.32	10.42	23.38	
15P	Cottonseed Meal		Found.	40.69	6.93	12.25	26.57	Adulterated hulls.
367A	Corn Chops.		Guarantee	9.74	3.28	2.41	69.43	
367B	Wheat Bran		Guarantee	14.50	3.50	10.00	50.00	
367C	Kafir Chops.		Guarantee	10.61	2.50	3.50	65.00	
367D	Corn and Kafir Chops.	Keel & Son.	Guarantee	9.25	3.00	3.00	70.50	
367E	Wheat Shorts.		Guarantee	15.00	3.00	5.00	60.00	
367G	Milo Chops.		Guarantee	9.25	2.50	2.50	65.00	

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Extract.	Ingredients.	Remarks.
15A	Corn Chops.....	Whaley Mill and Elevator Co.	Guarantee	9.00	4.30	2.53	72.73	Adul. with screenings
15B	Wheat Bran.....		Guarantee	16.45	3.80	8.46	56.76	.....
15C	Corn Chops and Corn Bran		Guarantee	9.00	4.30	2.53	72.72	.....
15D	Kafir Chops.....		Guarantee	9.00	3.00	3.00	70.00	.....
15E	Wheat Bran and Corn Bran		Guarantee	16.50	3.83	8.29	56.06	.....
15F	Wheat Shorts.....		Guarantee	16.00	4.00	5.00	60.00	.....
15G	Milo Chops.....		Guarantee	9.00	2.50	2.75	70.50	.....
15H	Mixed Chops.....		Found.....	10.25	2.82	1.79	72.33	.....
15H	Mixed Chops.....		Guarantee	9.20	2.80	2.00	70.50	.....
15H	Mixed Chops.....		Found.....	9.96	3.15	2.44	72.10	.....
1893A	Kafir Chops.....	J. C. Wooldridge.....	Guarantee	10.25	2.75	2.75	68.75	
1893B	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50	.....

GALENA, KANSAS.

2068A	Velvet Mixed Feed.....	Galena Mill and Elevator Co.	Guarantee	14.00	3.50	9.50	55.00	Wheat bran, shorts and screenings
2068A	Velvet Mixed Feed.....		Found.....	16.78	2.96	4.83	62.13	.....

GALVESTON, TEXAS.

1029A	Cottonseed Hull Screenings.	M. N. Bleich.....	Guarantee	24.00	2.50	25.00	30.00	Corn chops, wheat bran, alfalfa meal and salt.
1029B	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....
1029C	Corn Feed Meal.....		Guarantee	9.00	3.50	3.00	70.00	.....
1029D	Ground Oats.....		Guarantee	11.00	5.00	9.50	59.70	.....
1029E	Bleach Special Mixed Feed..		Guarantee	12.75	2.50	15.25	53.25	.....
1029F	Milo Chops.....		Guarantee	10.00	2.50	3.00	71.00	
1029F	Milo Chops.....		Found.....	9.77	2.77	2.05	71.84	.....

365A	Corn Chops.....	Guarantee	9.00	3.50	2.80	69.00	.....
365B	Corn Feed Meal.....	Guarantee	9.00	3.50	2.80	69.00	.....
365C	Red Seal Mixed Feed.....	Guarantee	12.00	4.00	17.00	48.00	Rice bran, cottonseed and alfalfa meal and salt.
365D	Red Seal Chick Feed.....	Guarantee	8.05	2.00	3.50	65.00	Corn grit, rice, millet and salt.
365E	Red Seal Chick Feed No. 1.	Guarantee	11.50	2.75	3.50	68.10	Corn and wheat.
365F	Red Seal Chick Feed No. 2.	Guarantee	11.50	2.75	3.50	68.00	Corn, wheat and milo.
365G	Red Seal Chicken Feed No. 3.	Guarantee	10.50	2.75	3.50	68.50	Cracked corn, wheat, milo, rice and sunflower seed.
365H	Red Seal Chicken Feed No. 4.	Guarantee	11.50	2.75	3.50	68.00	Cracked corn, wheat and milo.
365I	Red Seal Chicken Feed No. 6.	Guarantee	11.50	2.25	3.50	68.10	Cracked corn and wheat.
365J	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	20.00	.....
365K	Red Seal Molasses Feed.....	Guarantee	10.25	1.75	13.75	50.00	Alfalfa and cottonseed meal, corn chops, ground mill screenings and salt.
365L	Milo Chops.....	Guarantee	9.00	3.00	3.00	70.00	.....
339A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	.....
339B	Corn Feed Meal.....	Guarantee	9.00	4.00	3.00	70.00	.....
1226A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	24.00	.....
875A	Cottonseed Meal.....	Guarantee	47.00	8.00	7.00	22.00	.....
792A	Rice Bran.....	Guarantee	11.00	10.00	12.00	40.00	.....
56R	Rice Bran.....	Found.....	12.47	12.34	11.59	39.34	.....
792B	Rice Polish.....	Guarantee	11.00	7.00	6.00	45.00	.....
792C	Rice Hulls.....	Guarantee	2.50	1.25	35.00	30.00	.....
461A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	.....
461B	Corn Feed Meal.....	Guarantee	9.00	4.00	3.00	70.00	.....
461C	Ground Oats.....	Guarantee	11.00	3.28	13.45	55.16	.....
461D	Mixed Bran.....	Guarantee	12.00	6.00	12.00	45.00	Wheat and rice bran.
461E	Eureka Mixed Feed.....	Guarantee	10.50	2.75	12.00	55.00	Cracked corn, wheat bran, alfalfa meal and salt.
461F	Star Mixed Feed.....	Guarantee	10.00	5.00	15.00	40.00	Rice bran, rice polish, cracked corn, alfalfa and salt.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
461G	Ground Barley.....	Stolz & Petterson—Cont'd	Guarantee	11.00	1.75	6.00	65.00	.....	.....
461H	Crescent Mixed Feed.....		Guarantee	10.00	5.00	15.00	50.00	Corn feed meal, alfalfa meal, corn bran and salt.	.....
461I	Eureka Alfalfa Meal.....		Guarantee	11.00	1.75	20.00	30.00	.....	.....
461J	Corn Bran.....		Guarantee	8.00	3.00	12.00	55.00	.....	.....
461K	Superior Mixed Feed.....		Guarantee	12.00	4.00	17.00	48.00	Cracked corn, rice bran, cottonseed and alfalfa meal and salt.	.....
461L	Star Molasses Horse Feed..		Guarantee	11.90	5.30	13.50	40.00	Rice bran, cracked corn, molasses, cottonseed and alfalfa meal and salt.	.....
461M	Eureka Molasses Horse Feed		Guarantee	10.75	2.00	12.00	50.00	Ground oats, cracked corn, wheat bran, molasses, alfalfa meal and salt.	.....
461N	Eureka Molasses Cow Feed		Guarantee	13.90	2.20	11.00	45.00	Corn feed meal, wheat bran, cotton- seed and alfalfa meal, molasses and salt.	.....
461O	No. 2 Star Molasses Horse Feed.		Guarantee	12.25	2.50	11.25	50.50	Wheat bran, cracked corn, alfalfa and cottonseed meal, molasses and salt.	.....
461P	Superior Mixed Feed No. 2.		Guarantee	11.00	3.00	15.00	45.00	Cracked corn, alfalfa and cottonseed meal, wheat bran and salt.	.....
461Q	Corn Chops and Corn Bran		Guarantee	8.50	3.50	10.00	60.00	.....	.....
461R	Eureka Chick Feed.....		Guarantee	10.00	2.50	5.00	60.00	Wheat and kafir ground, cracked corn and millet.	.....
461S	Eureka Pigeon Feed.....		Guarantee	10.00	2.50	5.00	60.00	Wheat, cracked corn, kafir, Canada peas, hemp seed.	.....
461T	Eureka Hen Food.....		Guarantee	10.00	2.50	5.00	60.00	Wheat, cracked corn, kafir, cracked rice and sunflower seed.	.....
461U	Milo Meal.....		Guarantee	9.00	3.00	3.00	70.00	.....	.....
461V	Cracked Corn and Wheat...		Guarantee	10.00	2.50	5.00	60.00	.....	.....

461W	Star Dairy Feed.....	Guarantee	5.00	.50	25.00	45.00	Cottonseed hulls, alfalfa meal and blackstrap molasses.
461X	Milo Chops.....	Guarantee	9.00	3.00	3.00	70.00	Milo, alfalfa and cottonseed meal.
461Y	Superior Molasses Mixed Horse Feed.....	Guarantee	13.00	1.75	10.00	58.00	Molasses and salt.
461Z	Superior Molasses Mixed Cow Feed.....	Guarantee	13.00	1.75	10.00	58.00	Milo, alfalfa and cottonseed meal.
461A1	Eureka Hen Food with Grit	Guarantee	10.00	2.50	5.00	60.00	Wheat, cracked corn, milo, sum-flower seed and grit.
461A1	Eureka Hen Food with Grit	Found.....	11.75	2.75	2.59	67.55	Wheat shorts, wheat bran, corn feed meal, alfalfa and flax seed
461B1	Eureka Chicken Chowder with Charcoal.	Guarantee	12.50	3.60	12.00	53.00	meal, meat scraps, salt and charcoal.
461B1	Eureka Chicken Chowder with Charcoal.	Found.....	17.00	4.50	9.52	50.51	
1582A	Cottonseed Meal.....	Guarantee	44.00	7.00	9.00	23.00	
146A	Corn Chops.....	Guarantee	9.47	3.85	3.44	69.12	
146C	Wheat Shorts.....	Guarantee	15.00	4.45	5.00	60.00	
146D	Mixed Bran.....	Guarantee	14.50	3.75	10.00	54.16	Corn and wheat bran.
146F	Wheat Bran and Screenings	Guarantee	14.50	3.75	8.45	54.16	
240A	Corn Chops.....	Guarantee	9.00	3.50	2.80	69.00	
240B	Corn Feed Meal.....	Guarantee	9.00	3.50	2.90	69.00	
240C	Dried Beet Pulp.....	Guarantee	8.00	.50	20.00	60.00	
240D	Alcobe Mixed Feed.....	Guarantee	10.50	2.50	20.00	55.00	Corn chops, wheat bran, beet pulp, alfalfa meal and salt.
240E	Mixed Feed.....	Guarantee	10.50	2.50	20.00	55.00	Rice bran, corn chops, alfalfa and cottonseed meal and salt.
240F	Mixed Feed T. C.....	Guarantee	9.00	3.50	2.80	68.00	Corn chops, rice bran, alfalfa and cottonseed meal, clippings and salt.
240G	Mixed Chops.....	Guarantee	9.00	3.00	3.00	68.00	Corn and kafir chops.
240H	Mixed Feed Alcobe No. 2...	Guarantee	10.50	2.50	20.00	55.00	Corn chops, wheat bran, alfalfa meal and salt.

Texas Cottonseed Crushers' Association.

Texas Star Flour Mills.....

Wisrodt Grain Co.....

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-free Extract.	Ingredients.	Remarks.
1037A	Cottonseed Meal.....	E. H. Young.....	Guarantee	44.00	7.00	11.00	23.00	.....
1037B	Young's Dairy Feed.....		Guarantee	17.00	2.70	34.00	35.00	Cottonseed hulls and meal.....	
1037C	Screened Cottonseed Cake..		Guarantee	44.00	7.00	11.00	23.00	.....
GANADO, TEXAS.									
1290A	Rice Polish.....	Ganado Mill and Elevator Co.	Guarantee	11.00	6.00	3.50	55.00	.....
51T	Rice Polish.....		Found.....	12.63	13.13	2.07	57.86	.....
1290B	Rice Bran.....		Guarantee	12.64	11.95	7.92	44.93	.....
50T	Rice Bran.....		Found.....	14.25	18.79	12.36	34.78	.....
1290C	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....
1290D	Milo Chops.....		Guarantee	10.00	2.50	3.00	71.00	.....
1290D	Milo Chops.....	Found.....	10.65	2.66	2.07	71.87	.....	
GARBER, OKLAHOMA.									
669A	Corn Chops.....	Garber Milling Co.....	Guarantee	9.00	4.00	3.00	70.00	.....
GARLAND, TEXAS.									
1891A	Cottonseed Meal.....	Garland Cotton Oil Co.....	Guarantee	44.00	7.00	11.00	24.00	.....
56Y	Cottonseed Meal.....		Found.....	45.01	6.70	10.62	25.88	.....
1891B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	24.00	.....
55Y	Cottonseed Cake.....		Found.....	44.13	6.39	10.75	26.23	.....
303A	Corn Chops.....	T. H. Mealer.....	Guarantee	9.00	3.00	2.35	70.00	.....
303B	Milo Chops.....		Guarantee	9.00	2.75	3.00	71.00	.....
GARZA, TEXAS.									
777A	Corn Chops.....	Garza Mill Co.....	Guarantee	9.00	4.00	3.00	70.00	.....

GASOLENE, TEXAS.

1162A	Corn Chops.....	John T. Findley.....	{	Guarantee	9.50	3.50	3.00	70.00	
1162A	Corn Chops.....		}	Found....	9.94	4.97	2.63	72.27	

GATESVILLE, TEXAS.

490A	Cottonseed Meal.....	Gatesville Cotton Oil Co.....	{	Guarantee	45.00	6.00	11.00	22.00	
111R	Cottonseed Meal.....		}	Found....	45.79	7.83	9.47	26.33	
75B	Cottonseed Meal.....				44.98	7.00	10.84	24.56	
490B	Cottonseed Cake.....		{	Guarantee	45.00	6.00	11.00	22.00	
76B	Cottonseed Cake.....		}	Found....	46.19	7.13	9.03	23.08	
334A	Corn Chops.....	Gatesville Roller Mill.....	{	Guarantee	9.00	4.00	3.00	70.00	
334B	Mixed Bran and Shorts.....		}	Guarantee	15.00	4.50	10.00	50.00	Wheat and corn bran and wheat shorts.
82B	Mixed Bran and Shorts.....			Found....	16.75	4.40	8.62	54.46	
334C	Wheat Bran.....		{	Guarantee	17.50	4.00	5.00	55.00	
713A	Corn Chops.....	F. T. McCollum.....		Guarantee	9.00	3.00	3.00	70.00	
1128A	Corn Chops.....	R. E. Meeks.....	{	Guarantee	9.50	3.50	3.00	70.00	
1128A	Corn Chops.....		}	Found....	9.88	4.08	2.28	69.37	
839A	Corn Chops.....	T. A. Morgan.....	{	Guarantee	9.00	4.00	3.00	70.00	
839B	Chopped Ear Corn.....		}	Guarantee	7.83	3.04	10.48	68.05	
1154A	Corn Chops.....	J. W. Riddle.....		Guarantee	9.00	3.50	3.50	70.00	

GEARY, OKLAHOMA.

609A	Corn Chops.....	Blaine County Mill and Elevator Co.....		Guarantee	9.00	4.00	3.00	70.00	
671A	Wheat Bran.....	Geary Milling Co.....		Guarantee	14.50	3.50	10.00	50.00	
1166A	Wheat Mixed Feed.....	Geary Milling and Elevator Co.....	{	Guarantee	16.00	4.00	9.00	55.00	Wheat bran and shorts.
1166B	Corn Chops.....		}	Guarantee	9.00	3.50	3.50	70.00	

TEXAS AGRICULTURAL EXPERIMENT STATION.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
2088A	Corn Chops.....	Burson & King.....	{ Guarantee Found.....	9.50	3.50	3.00	70.00	.....	.....
2088A	Corn Chops.....			9.75	3.86	2.25	70.63	.....	.....
950A	Corn Chops.....	Fritz Giron.....	Guarantee	9.00	3.50	3.00	70.00	.....	.....
1810A	Corn Chops.....	Georgetown Corn Mill.....	Guarantee	9.00	3.50	3.00	70.00	.....	.....
116A	Cottonseed Meal.....	{	Guarantee	44.00	7.00	11.00	24.00	.....	.....
55B	Cottonseed Meal.....		Found.....	43.26	7.72	9.56	25.27	.....	.....
116B	Cottonseed Meal.....		Guarantee	44.00	7.00	11.00	24.00	.....	.....
54B	Cottonseed Cake.....		Found.....	43.13	7.43	9.98	24.34	.....	.....
116C	Pide's Delight.....	{	Guarantee	11.50	3.00	39.00	32.80	Cottonseed hulls and meal.	.....
52B	Pide's Delight.....		Found.....	15.77	3.97	35.62	31.39	.....	.....
116D	Cold Pressed Cottonseed.....		Guarantee	24.80	7.00	25.00	27.00	.....	.....
53B	Cold Pressed Cottonseed.....		Found.....	31.75	6.46	20.37	30.40	.....	.....
116E	Cottonseed Meal and Hulls	{	Guarantee	39.00	6.00	18.00	26.00	.....	.....
116E	Cottonseed Meal and Hulls		Found.....	39.47	7.51	15.95	27.43	.....	.....
116F	Cottonseed Expeller Cake		Guarantee	39.00	6.00	18.00	26.00	.....	.....
116F	Cottonseed Expeller Cake		Found.....	40.69	8.91	13.30	26.66	.....	.....
559A	Corn Chops.....	Young & Moore.....	Guarantee	9.00	4.00	3.00	70.00	.....	.....
560A	Cottonseed Meal.....	{	Guarantee	44.00	8.00	11.00	24.00	.....	.....
41Y	Cottonseed Meal.....		Found.....	46.82	7.90	7.36	25.53	.....	.....
622A	Cottonseed Meal.....	Giddings Industrial Corporation.	Guarantee	44.00	8.00	7.00	24.00	.....	.....

GIDDINGS, TEXAS.

1501A	Cottonseed Meal.....	Lee County Cotton Oil Co.	Guarantee	44.00	7.00	11.00	22.00
40Y	Cottonseed Meal.....		Found....	46.00	10.25	8.20	23.88
1501B	Cottonseed Feed Ground....		Guarantee	40.00	6.00	14.00	24.00
1501B	Cottonseed Feed Ground....		Found....	38.57	6.03	14.65	27.24
1501C	Cottonseed Feed Cracked....		Guarantee	40.00	6.00	14.00	24.00
1501C	Cottonseed Feed Cracked....		Found....	40.70	5.73	13.49	25.95
342A	Corn Chops.....	Lee County Corporate Association.	Guarantee	9.00	4.00	3.00	70.00

GILMER, TEXAS.

1559A	Cold Pressed Cottonseed....	Gilmer Cottonseed Oil Co.	Guarantee	26.00	7.00	28.00	28.00
129Y	Cold Pressed Cottonseed....		Found....	25.13	7.34	24.61	28.14
62P	Cold Pressed Cottonseed....		Found....	26.25	8.83	24.45	25.92
63P	Cold Pressed Cottonseed....		Found....	23.99	10.55	22.95	28.36
1559B	Ground Cold Pressed Cottonseed.		Guarantee	26.00	7.00	28.00	28.00

GINGER, TEXAS.

2144A	Corn Chops.....	T. J. Shaw Jersey Farm...	Guarantee	9.50	3.50	3.00	70.00
2144A	Corn Chops.....		Found....	7.88	3.84	2.80	72.95

GINSITE, TEXAS.

1685A	Corn Chops.....	J. R. Finch.....	Guarantee	9.00	3.50	3.00	70.00
799A	Corn Chops.....	Willett Milling Co.....	Guarantee	10.10	3.89	2.23	68.76

GLASGOW, MISSOURI.

1403A	Wheat Bran.....	Glasgow Milling Co.....	Guarantee	14.50	3.79	8.18	58.65
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GLAZIER, TEXAS.

2000A	Wheat Bran.....	Glazier Mill and Elevator Co.	Guarantee	16.00	3.50	9.00	54.00
2000A	Wheat Bran.....		Found....	17.26	3.50	6.08	55.53
2000B	Wheat Shorts.....		Guarantee	17.00	3.50	4.50	60.00

GLAZIER, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen in Extract.	Ingredients.	Remarks.
2000B	Wheat Shorts.....	Glazier Mill and Elevator Co.—Continued	Found....	15.91	1.66	1.03	68.51	.....
2000C	Kafir and Milo Chops.....		Guarantee	10.13	2.63	2.88	69.63	.....
2000C	Kafir and Milo Chops.....		Found....	10.88	2.86	1.99	71.68	.....
2000D	Wheat Chops.....		Guarantee	14.00	2.00	4.00	65.00	.....
2000D	Wheat Chops.....		Found....	15.32	1.57	3.21	67.43	.....
2000E	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....
2000E	Corn Chops.....		Found....	10.43	4.30	2.01	71.93	.....
2000F	Corn Chops and Corn Bran		Guarantee	9.00	3.50	3.00	70.00	.....
2000F	Corn Chops and Corn Bran		Found....	11.15	4.47	2.25	70.25	.....
2000G	Rolled Barley.....		Guarantee	11.00	1.50	6.00	64.00	.....
2000G	Rolled Barley.....		Found....	10.44	1.95	6.78	65.80	.....
2000H	Kafir, Milo and Wheat Bran		Guarantee	12.06	3.06	5.94	61.81	.....
2000H	Kafir, Milo and Wheat Bran		Found....	13.28	3.27	5.58	62.80	.....
2000I	Wheat Bran and Screenings		Guarantee	16.00	3.50	9.00	54.00	.....
2000I	Wheat Bran and Screenings		Found....	14.83	3.39	5.35	59.86	.....

GOMEZ PALACIO, DGO. MEXICO.

1931A	Cottonseed Meal.....	Cia. Industrial Jabonera de la Laguna, S. A.	Guarantee	44.77	7.76	7.59	25.22	.....
1931B	Cottonseed Cake.....		Guarantee	44.77	7.76	7.59	25.22	.....

GLEN COVE, TEXAS.

2042A	Wheat Bran.....	Perry & Allen.....	Guarantee	14.50	3.50	9.00	55.00	.....
2042A	Wheat Bran.....		Found....	17.97	3.87	6.32	57.13	.....

GLEN FLORA, TEXAS.

997A	Corn Chops.....	Waerden Brothers.....	Guarantee	9.00	3.50	3.00	70.00	
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GLEN ROSE, TEXAS.

56A	Wheat Bran.....		Guarantee	17.12	3.77	10.00	54.43	
56B	Wheat Mixed Feed.....	Glen Rose Mills.	Guarantee	16.80	3.77	8.50	54.00	Wheat bran and shorts.
56B	Wheat Mixed Feed.....		Found....	17.13	4.39	8.33	53.54	

GODLEY, TEXAS.

308A	Corn Chops.....		Guarantee	9.00	3.00	2.00	70.00	
308B	Mixed Feed.....		Guarantee	9.00	3.50	16.00	50.00	Wheat and corn bran, wheat chops and rice hulls.
308C	Mixed Feed.....	Godley Mill and Elevator Co.	Guarantee	10.00	3.00	12.00	50.00	Wheat and corn bran and rice hulls.
308D	Wheat and Corn Bran.....		Guarantee	14.00	3.50	10.00	52.00	
308E	Wheat Chops.....		Guarantee	12.50	1.50	5.00	60.00	
308F	Mixed Feed.....		Guarantee	14.00	3.25	6.00	66.00	Wheat bran and kafir chops.

GOLDTHWAITE, TEXAS.

138A	Corn Chops.....		Guarantee	9.50	3.50	3.00	70.00	
138A	Corn Chops.....	Frizzell & Gesslin.	Found....	10.08	3.86	2.18	70.77	
138B	Milo Chops.....		Guarantee	10.00	2.50	3.00	71.00	
138B	Milo Chops.....		Found....	10.25	2.55	2.82	72.51	

GOLIAD, TEXAS.

598A	Corn Chops.....	Mathis & Davis.	Guarantee	9.00	3.50	3.00	70.00	
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GOMEZ, TEXAS.

918A	Corn Chops.....		Guarantee	9.00	4.00	3.00	70.00	
918B	Kafir Head Chops.....	Gomez Mill and Gin Co.	Guarantee	8.50	2.50	6.00	65.00	
188A	Milo Head Chops.....		Guarantee	9.75	2.40	7.50	65.00	
188A	Milo Head Chops.....	A. C. Shepherd.	Found....	8.41	2.47	7.71	69.70	

GONZALES, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Ex- tract.	Ingredients.	Remarks.
1717A	Corn Chops.....	Tom Dawe & Son.....	Guarantee	9.00	3.50	3.00	60.00	.....
388A	Cottonseed Meal.....	Gonzales Oil and Manu- facturing Co.	Guarantee	44.00	7.00	11.00	23.00	.....	Adulterated bulls.
397	Cottonseed Meal.....		Found....	43.63	6.72	12.02	24.69	.....
388B	Screened Cottonseed Cake..		Guarantee	44.00	7.00	11.00	22.00	.....
407	Screened Cottonseed Cake..		Found....	45.51	6.53	9.72	24.28	.....
2114A	Corn Chops.....	F. J. O'Connor.....	Guarantee	9.50	3.50	3.00	70.00	.....
2114A	Corn Chops.....		Found....	9.78	4.13	2.37	71.17	

GOODNIGHT, TEXAS.

1668A	Kafir Chops.....	B. G. Ellzey.....	Guarantee	9.00	2.50	3.00	71.00	
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GORMAN, TEXAS.

2151A	Corn Chops.....	C. Martin.....	Guarantee	9.50	3.50	3.00	70.00	
2151A	Corn Chops.....		Found....	9.50	4.09	2.64	73.23	
978A	Corn Chops.....	F. S. Perry.....	Guarantee	9.00	3.50	3.00	70.00	.....
978B	Cold Pressed Cottonseed... 1W		Guarantee	25.50	6.65	25.00	30.00	.....
978C	Whole Pressed Peanut Cake		Found....	25.39	8.82	25.30	27.02	.....
978C	Whole Pressed Peanut Cake		Guarantee	36.00	6.00	23.00	20.00	.....
978D	Whole Pressed Peanut Meal		Found....	35.44	12.58	20.13	19.60	.....
978D	Whole Pressed Peanut Meal		Guarantee	36.00	6.00	23.00	20.00	.....
978D	Whole Pressed Peanut Meal		Found....	34.91	13.18	18.59	22.38	

GRABALL, TEXAS.

832A	Corn Chops.....	J. I. Bolton.....	Guarantee	9.00	4.00	3.00	70.00	
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GRAHAM, TEXAS.

1083A	Corn Chops.....	Guarantee	9.50	3.50	3.00	70.00
1083A	Corn Chops.....	Found.....	10.63	4.32	2.55	70.33
1083B	Milo Chops.....	Guarantee	10.00	2.50	3.00	71.00	.....
1083B	Milo Chops.....	Found.....	12.90	3.31	2.25	67.97	.....
465A	Kafir Head Chops.....	Guarantee	9.05	2.05	7.05	62.00	.....
465B	Milo Head Chops.....	Guarantee	9.50	2.50	7.50	62.00	.....
465C	Kafir Chops.....	Guarantee	9.50	2.75	3.00	71.00	.....
721A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	23.00	.....
721B	Cottonseed Cake.....	Guarantee	44.00	7.00	11.00	23.00	.....
664A	Corn Chops.....	Guarantee	9.00	4.00	3.70	66.50	.....
664B	Wheat Bran.....	Guarantee	16.00	5.00	9.00	55.00	.....
664C	Mixed Wheat and Corn Bran.....	Guarantee	16.00	3.00	8.00	56.00	.....
664D	Mixed Bran and Screenings.....	Guarantee	16.00	3.00	8.00	56.00	Wheat and corn bran and wheat screenings.
664E	Wheat Bran and Screenings.....	Guarantee	16.00	5.00	9.00	55.00	.....
664F	Milo Chops.....	Guarantee	10.00	2.50	3.00	71.00	.....
664F	Milo Chops.....	Found.....	10.50	2.79	2.37	72.10	.....

GRANDBURY, TEXAS.

632A	Cottonseed Meal.....	Guarantee	44.00	8.00	11.00	24.00	.....
632B	Cottonseed Cake.....	Guarantee	44.00	8.00	11.00	24.00	.....
64W	Cottonseed Cake.....	Found.....	44.13	6.95	9.74	24.16	.....
979A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	.....
979B	Wheat Mixed Feed.....	Guarantee	15.00	3.50	10.00	50.00	Wheat bran and shorts.
979C	Mixed Feed.....	Guarantee	14.00	3.75	11.00	54.00	Corn and wheat bran.
979D	Mixed Feed.....	Guarantee	17.00	2.75	7.00	60.00	Corn meal, flour and wheat bran.
979E	Mixed Feed.....	Guarantee	15.00	3.00	6.00	60.00	Screenings, wheat and corn bran, shorts, flour, corn meal, kafir and milo.
979F	Kafir and Milo Chops.....	Guarantee	9.50	3.75	3.00	71.00	.....
979G	Wheat Shorts.....	Guarantee	16.00	4.00	5.00	60.00	.....

GRAND PRAIRIE, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Extract.	Ingredients.	Remarks.
99A	Corn Chops.....	Grand Prairie Mill and Elevator Co.	Guarantee	10.04	4.21	2.52	74.13	.....	.....
99B	Wheat Bran.....		Guarantee	16.16	4.80	8.42	63.05	.....	.....
747A	Corn Chops.....	Stubbs Brothers.	Guarantee	9.00	4.00	3.00	70.00	.....	.....

GRANDVIEW, TEXAS.

071A	Corn Chops.....	J. F. Edwards.	Guarantee	9.50	3.50	3.00	70.00	.....	.....
072A	Corn Chops.....		Found....	10.66	4.18	1.97	69.89	.....	.....
539A	Cottonseed Meal.....	Grandview Cotton Oil Mill	Guarantee	45.00	6.00	11.00	20.00	.....	.....
539B	Cottonseed Cake.....		Guarantee	45.00	6.00	11.00	20.00	.....	.....
090A	Corn Chops.....	Morgan-Maston Co.	Guarantee	9.00	3.50	3.00	70.00	.....	.....
725A	Corn Chops.....	D. D. Dittz.	Guarantee	9.00	4.00	3.00	70.00	.....	.....
975A	Corn Chops.....	Siratt & Edwards.	Guarantee	9.00	3.50	3.00	70.00	.....	.....

GRANGER, TEXAS.

558A	Corn Chops.....	Granger Milling Co.	Guarantee	9.00	3.50	3.00	70.00	.....	.....
734A	Cottonseed Meal.....		Guarantee	44.00	7.00	11.00	24.00	.....	.....
8B	Cottonseed Meal.....	Granger Oil Mill	Found....	46.62	7.02	9.62	25.48	.....	.....
734B	Screened Cottonseed Cake..		Guarantee	44.00	7.00	11.00	24.00	.....	.....
734C	Cottonseed Meal and Hulls		Guarantee	40.00	6.00	14.00	22.00	.....	.....
57B	Cottonseed Meal and Hulls		Found....	40.66	6.18	13.72	25.22	.....	.....
745A	Corn Chops.....	W. C. Reinhardt.	Guarantee	9.00	3.50	3.00	70.00	.....	.....

GRAPEVINE, TEXAS.

1290A	Corn Chops.....	J. W. Brock.....	Guarantee	9.00	3.00	3.50	70.00	
145A	Corn Chops.....	Grapevine Roller Mills.....	Guarantee	9.00	4.00	3.00	70.00	
145B	Wheat Bran.....		Guarantee	14.50	3.00	10.00	50.00	
145C	Wheat Shorts.....		Guarantee	15.00	3.00	5.00	60.00	

GREAT BEND, KANSAS.

1160A	Wheat Bran.....	Barton County Flour Mills	Guarantee	15.50	3.50	10.00	55.00	
1160B	Wheat Mixed Feed.....		Guarantee	15.00	3.25	9.00	56.00	Wheat bran and shorts.
1160C	Corn Chops.....		Guarantee	9.00	3.50	3.50	70.00	
1160D	Wheat Shorts.....		Guarantee	16.00	3.50	5.00	60.00	
101T	Wheat Shorts.....		Found....	17.13	4.65	6.33	56.48	Adul. wheat bran.
1699A	Wheat Shorts.....	Walnut Creek Milling Co.	Guarantee	18.00	3.50	5.60	50.00	
1699B	Wheat Mixed Feed and Screenings.....		Guarantee	16.00	3.25	7.50	50.00	Wheat bran shorts and screenings.
1699D	Wheat Bran and Screenings		Guarantee	14.50	3.50	10.00	51.23	
1699D	Wheat Bran and Screenings		Guarantee	17.40	4.33	10.59	50.05	

GREELEY, COLORADO.

1101A	Wheat Mixed Feed.....	Model Milling Co.....	Guarantee	14.50	3.50	10.50	50.00	Wheat bran and shorts.....
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GREENVILLE, TEXAS.

260A	Cottonseed Meal.....	Greenville Cotton Oil Co..	Guarantee	45.00	6.00	11.00	20.00	
131Y	Cottonseed Meal.....		Found....	43.41	5.39	10.70	24.75	
31R	Cottonseed Meal.....		Found....	42.63	5.03	11.07	28.13	Adulterated hulls.
32R	Cottonseed Meal.....		Found....	43.13	6.45	10.80	24.42	
260B	Cottonseed Cake.....		Guarantee	45.00	6.00	11.00	20.00	
53Y	Cottonseed Cake.....		Found....	43.32	5.06	11.75	27.09	Adulterated hulls.
54Y	Cottonseed Meal.....		Found....	45.19	5.45	10.77	25.55	
260C	Choice Cottonseed Meal.....		Guarantee	48.00	7.00	9.00	20.00	

GREENVILLE, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Moisture.	Ingredients.	Remarks.
101A	Wheat Bran.....	Greenville Mill and Elevator Co.	Guarantee	15.00	3.70	6.90	59.00		
101B	Wheat Bran, Shorts, Corn Bran and Screenings.		Guarantee	15.00	4.00	8.00	54.00		
101C	Corn Chops.....		Guarantee	9.00	4.00	3.00	70.00		
101D	Wheat Shorts.....		Guarantee	14.50	3.50	5.00	60.00		
101E	Mixed Chops.....		Guarantee	9.50	3.00	3.00	70.25	Milo and corn chops.	
101F	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50		
2105A	Cottonseed Meal.....	Texas Refining Co.	Guarantee	44.00	6.00	9.00	24.00		Adulterated hulls.
2105A	Cottonseed Meal.....		Found.....	42.25	6.66	10.44	26.07		
2105B	Cottonseed Meal.....		Guarantee	44.00	6.00	9.00	24.00		
2105B	Cottonseed Meal.....		Found.....	42.94	6.42	10.01	25.81		Adulterated hulls.
192A	Corn Chops.....	Weather Grain Co.	Guarantee	9.00	3.50	3.00	70.00		
192B	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50		

GROESBECK, TEXAS.

1512A	Corn Chops.....	E. A. Allen.....	Guarantee	9.00	3.00	3.00	69.00		
940A	Corn Chops.....	Proctor & Allen.....	Guarantee	9.00	3.50	3.00	70.00		

GROOM, TEXAS.

2116A	Milo Chops.....	Farmers Grain and Elevator Co.	Guarantee	11.06	2.86	2.65	71.05		
2116A	Milo Chops.....		Found.....	11.38	3.05	3.11	70.32		

GUADALUPE, TEXAS.

1667A	Corn Chops.....	E. H. Powitzky.....	Guarantee	9.00	3.50	3.00	70.00		
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GUTHRIE, OKLAHOMA.

1567A	Cottonseed Meal.....	{ Guthrie Cotton Oil Co.	Guarantee	44.00	7.00	11.00	24.00
1567B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	24.00	.....
285A	Wheat Bran and Screenings	{ Guthrie Mill and Elevator	Guarantee	14.75	3.75	10.00	55.00	.....
285B	Wheat Mixed Feed and Screenings.		Guarantee	16.75	3.90	8.50	54.70	Wheat bran, shorts and screenings..
285C	Standard Wheat Shorts.....	{	Guarantee	17.15	4.10	4.23	61.00	.....
285D	Corn Chops.....		Guarantee	9.00	4.00	3.00	70.00	.....
1224A	Corn Chops.....	{ Model Milling Co.	Guarantee	9.00	3.00	3.50	70.00	.....
1224C	Wheat Bran.....		Guarantee	18.90	3.55	8.63	53.15	.....
1224D	Kafir Meal.....		Guarantee	10.37	3.00	2.56	70.99	.....
1224E	Mixed Feed.....		Guarantee	12.15	2.75	2.05	71.80	Wheat flour and kafir meal.....
1224F	Mixed Feed.....		Guarantee	14.01	3.33	5.02	63.68	Wheat mixed feed and kafir meal..

HAGERMAN, NEW MEXICO.

112A	Peerless Alfalfa Meal.....	Pecos Valley Alfalfa Mill Co.	Guarantee	13.00	2.00	28.00	35.00
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HALE CENTER, TEXAS.

2107A	Feterita Chops.....	{	Guarantee	10.00	2.75	3.00	69.00
2107A	Feterita Chops.....		Found.....	11.88	2.68	2.08	70.07
2107B	Milo Chops.....	{ Joe Lee Ferguson.....	Guarantee	10.00	2.50	3.00	69.00	.....
2107B	Milo Chops.....		Found.....	10.19	2.55	2.22	70.92	.....
2107C	Milo and Kafir Head Chops	{	Guarantee	9.50	2.60	8.00	68.00	.....
2107C	Milo and Kafir Head Chops		Found.....	9.15	2.71	6.08	66.95	.....

HALETTTSVILLE, TEXAS.

328A	Cottonseed Meal.....	{	Guarantee	45.00	6.00	11.00	23.00	.....
4T	Cottonseed Meal.....		Found.....	47.37	7.74	7.27	25.43	.....
328B	Cottonseed Cake.....	{ Lavaca Oil Co.....	Guarantee	45.00	6.00	11.00	23.00	.....
58T	Cottonseed Cake.....		Found.....	49.94	6.65	5.52	23.93	.....

HALSTEAD, KANSAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen.	Ingredients.	Remarks.
481A	Wheat Bran.....	Halstead Milling and Elevator Co.	Guarantee	14.50	3.50	10.00	50.00	.....	.....
481B	Wheat Mixed Feed.....		Guarantee	15.00	3.75	8.00	55.00	Wheat bran and shorts.	.....
481C	Wheat White Shorts.....		Guarantee	14.50	3.00	3.50	50.00	.....	.....
481D	Wheat Mixed Feed and Screenings.		Guarantee	16.00	3.50	9.00	50.00	Wheat bran, shorts and screenings.	.....
481E	Wheat Bran and Screenings		Guarantee	14.50	3.50	11.50	52.00	.....	.....

HAMILTON, TEXAS.

1328A	Cottonseed Cake.....	Bendini Oil Mill.....	Guarantee	44.00	7.00	11.00	22.00	.....	.....
44B	Cottonseed Cake.....		Found....	46.63	8.04	8.60	24.07	.....	.....
1328B	Cottonseed Meal.....		Guarantee	44.00	7.00	11.00	22.00	.....	.....
45B	Cottonseed Meal.....	Hamilton Mill and Elevator Co.	Found....	46.40	7.59	9.33	24.83	.....	.....
62A	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....	.....
62B	Wheat Bran.....		Guarantee	15.00	3.81	7.42	64.14	.....	.....
62C	Mixed Feed.....		Guarantee	14.00	3.00	6.00	60.00	Milo and kafir chops and wheat bran	.....
62D	Wheat Chops.....		Guarantee	16.00	2.00	3.50	64.50	.....	.....
62E	Mixed Feed.....		Guarantee	9.50	3.50	3.50	71.80	Corn and kafir chops.	.....
62F	Kafir Chops.....		Guarantee	10.90	3.12	2.75	71.18	.....	.....
62G	Mixed Feed.....		Guarantee	14.00	3.00	6.00	60.00	Wheat bran and kafir chops.	.....
62H	Wheat Bran and Screenings		Guarantee	17.00	3.91	9.00	54.00	.....	.....
62I	Mixed Feed.....		Guarantee	12.00	2.80	12.00	50.00	Wheat bran, flour and rice hulls.	.....

HAMLIN, TEXAS.

698A	Cottonseed Meal.....	Hamlin Cotton Oil Co.....	Guarantee	44.00	7.00	11.00	21.50	.....	Adulterated hulls.
80W	Cottonseed Meal.....		Found....	42.38	10.36	10.78	23.09	.....	Adulterated hulls.
31W	Cottonseed Meal.....		Found....	42.56	8.20	11.37	24.36	.....	.....
698B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	21.50	.....	.....
32W	Cottonseed Cake.....		Found....	43.01	8.54	10.53	24.30	.....	.....

1467A	Corn Chops.....	{	Hamlin Elevator Co.....	{	Guarantee	9.00	3.00	3.00	65.00	70.00	Corn and milo chops.....
1467B	Mixed Chops.....	{		{	Guarantee	9.50	3.40	3.00			

HAMMOND, INDIANA.

2107A	Corn Distiller's Grains.....	{		{	Guarantee	30.00	10.00	14.00	30.00		
2107A	Corn Distiller's Grains.....	{		{	Found.....	28.80	8.75	14.68	28.55		
2170B	Unicorn Dairy Ration.....	{	Chapin & Co.....	{	Guarantee	26.00	5.50	10.00	46.10		Corn distillers' grains, cottonseed, linseed, hominy meal, gluten feed, malt sprouts, brewers' grains wheat bran and salt.....
2170B	Unicorn Dairy Ration.....	{		{	Found.....	25.46	7.25	11.50	42.96		

HAPPY, TEXAS.

1172A	Corn Chops.....	{		{	Guarantee	9.00	3.50	3.50	70.00		
1172B	Milo Head Chops.....	{	Plains Lumber and Grain Co.	{	Guarantee	8.50	2.50	7.00	65.00		
1172C	Kafir Head Chops.....	{		{	Guarantee	8.50	2.50	7.00	65.00		
1119A	Milo Head Chops.....	{	John Wiggins.....	{	Guarantee	8.50	2.00	7.00	65.00		

HARPER, KANSAS.

412A	Corn Chops.....	{		{	Guarantee	9.00	4.00	3.00	70.00		
412B	Wheat Bran.....	{	Harper Mill and Elevator Co.	{	Guarantee	14.50	3.50	8.00	55.00		
412C	Wheat Bran.....	{		{	Guarantee	14.50	3.50	10.00	50.00		

HARRISONVILLE, MISSOURI.

1476A	Mixed Feed.....	{	Polk Bros.....	{	Guarantee	15.00	3.75	9.00	55.00		Wheat bran, shorts, corn bran and ground wheat screenings.....
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HARLORD, TEXAS.

700A	Corn Chops.....	{	John Zeiselt.....	{	Guarantee	9.00	4.00	3.00	70.00		
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No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
596A	Corn and Cob Meal.....	Hartley Grain and Fuel Co.	Guarantee	8.50	3.00	6.00	64.00	.....
596B	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.00	.....
596C	Mixed Chops.....		Guarantee	11.00	2.00	3.00	70.00	Wheat and milo chops.	
596D	Corn Chops.....		Guarantee	9.00	3.00	2.50	70.00	.....
596E	Wheat and Corn Chops.....		Guarantee	14.00	3.00	3.00	67.00	.....
596F	Mixed Chops.....		Guarantee	9.00	2.50	3.00	70.00	Corn and milo chops.	
HARTMAN, COLORADO.									
1824A	Alfalfa Meal.....	Denver Alfalfa Milling and Products Co.	Guarantee	13.00	1.50	35.00	35.00	.....
HASKELL, TEXAS.									
916A	Corn Chops.....	Decker & Frierson.....	Guarantee	9.50	3.50	3.00	70.00	.....
916A	Corn Chops.....		Found....	9.50	4.11	3.13	71.47	.....
916B	Kafir Chops.....		Guarantee	10.50	2.75	3.00	69.50	.....
916B	Kafir Chops.....		Found....	13.13	3.32	2.13	68.54	.....
916C	Milo Chops.....		Guarantee	10.50	2.50	3.00	71.00	.....
916C	Milo Chops.....		Found....	11.69	3.14	2.30	71.24	.....
1887A	Mixed Chops.....	Sherrill Elevator Co.....	Guarantee	12.00	2.25	4.00	68.00	Milo, wheat and oat chops.	
1887B	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50	.....
1887C	Wheat Chops.....		Guarantee	14.00	2.00	4.00	65.00	.....
1113A	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	22.00	.....
1113B	Cottonseed Meal.....		Guarantee	44.00	7.00	11.00	22.00	.....
5W	Cottonseed Meal.....		Found....	44.75	6.88	11.72	24.75	.....
6W	Cottonseed Meal.....		Found....	39.31	6.59	15.32	24.97	.....	Adulterated hulls.
7W	Cottonseed Meal.....		Found....	40.29	8.04	13.18	25.74	.....	Adulterated hulls.

		Western Cotton Oil and Gin Co.				Adulterated hulls.			
		Found.	Guarantee	Found.	Guarantee	Found.	Guarantee	Found.	Guarantee
8W	Cottonseed Meal	39.54	8.16	12.71	26.76	39.54	8.16	12.71	26.76
1113D	Butterfat Mixed Feed	14.00	3.00	40.00	30.00	14.00	3.00	40.00	30.00
4W	Butterfat Mixed Feed	11.58	3.11	40.08	32.94	11.58	3.11	40.08	32.94
1113E	Cottonseed Meal and Hulls	42.00	6.00	12.00	24.00	42.00	6.00	12.00	24.00
1113E	Cottonseed Meal and Hulls	42.88	7.06	11.83	24.91	42.88	7.06	11.83	24.91
1113F	Cottonseed Cake and Hulls	36.00	6.00	15.00	24.00	36.00	6.00	15.00	24.00
1113F	Cottonseed Cake and Hulls	43.42	6.75	11.29	24.80	43.42	6.75	11.29	24.80
34W	Cottonseed Cake and Hulls	37.75	5.98	15.29	26.89	37.75	5.98	15.29	26.89
1113G	Cottonseed Meal and Hulls	36.00	6.00	15.00	24.00	36.00	6.00	15.00	24.00
1113G	Cottonseed Meal and Hulls	40.25	7.88	11.88	27.24	40.25	7.88	11.88	27.24

HASTINGS, OKLAHOMA.

1034A	Corn Chops	Farmers' Mill and Elevator Co.	9.00	3.00	3.00	70.00	3.00	70.00	3.00
1180A	Corn Chops	Hastings Hardware Co.	9.00	3.50	3.50	70.00	3.50	70.00	3.50
1589A	Corn Chops	J. S. Mark	9.00	3.50	3.00	70.00	3.00	70.00	3.00

HAVEN, KANSAS.

712A	Wheat Bran	Guarantee	15.75	3.50	9.10	54.10	9.10	54.10	9.10
71T	Wheat Bran	Found.	17.76	4.51	9.32	52.31	9.32	52.31	9.32
712B	Corn Chops	Guarantee	9.40	3.50	2.60	70.86	2.60	70.86	2.60
712C	Wheat Shorts	Guarantee	16.60	3.50	5.50	57.80	5.50	57.80	5.50
712D	Wheat Mixed Feed	Guarantee	16.00	3.50	8.60	54.12	8.60	54.12	8.60

HAYS CITY, KANSAS.

1682A	Wheat Mixed Feed	Guarantee	16.00	3.75	9.00	55.00	9.00	55.00	9.00
1682B	Wheat Bran	Guarantee	15.00	3.00	8.14	54.00	8.14	54.00	8.14
1682C	Wheat Bran and Screenings	Guarantee	18.34	3.65	9.50	50.29	9.50	50.29	9.50
1682D	Wheat Mixed Feed and Screenings	Guarantee	18.02	4.31	8.81	53.92	8.81	53.92	8.81

HEARNE, TEXAS.

2026A	Corn Chops	P. L. Brady, Jr.	9.00	3.50	3.00	70.00	3.00	70.00	3.00
2026A	Corn Chops	Found.	8.66	3.57	2.63	69.58	2.63	69.58	2.63

HEARNE, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Extract.	Ingredients.	Remarks.
266A	Cottonseed Meal.....	Industrial Cotton Oil Products.	Guarantee	44.00	7.00	11.00	22.00	.....
42Y	Cottonseed Meal.....		Found.	45.06	7.07	9.65	25.51	.....
266B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	22.00	.....
266B	Cottonseed Cake.....		Found.	48.14	7.04	8.23	23.48	.....
43Y	Cottonseed Cake.....	Carmodo, Nicola.....	Found.	45.38	6.36	8.96	25.74	.....
1333A	Corn Chops.....		Guarantee	9.00	3.00	3.50	70.00	.....
220A	Cottonseed Meal.....	Planters Oil Co.....	Guarantee	44.00	7.00	11.00	24.00	.....
220B	Cottonseed Feed Cracked...		Guarantee	40.00	6.00	14.00	24.00	Cottonseed cake and hulls.	
220B	Cottonseed Feed Cracked...		Found.	45.54	7.27	9.49	23.85	.....
220C	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	24.00	.....
220D	Cottonseed Feed Ground...	Taylor-Haigle Grain Co.....	Guarantee	40.00	6.00	14.00	24.00	Cottonseed meal and hulls.	
220D	Cottonseed Feed Ground...		Found.	41.75	7.12	11.90	24.77	.....
1568A	Mixed Chops.....		Guarantee	9.00	4.00	3.50	70.00	Corn, milo, kafir and oat chops	

HEDLEY, TEXAS.

2168A	Corn Chops.....	Hedley Milling Co.....	Guarantee	9.50	3.50	3.00	70.00	.....
2168A	Corn Chops.....		Found.	9.37	4.40	2.81	72.81	.....
1967A	Corn Chops.....	N. M. Hornsby.....	Guarantee	9.00	3.50	3.00	70.00	.....
1967B	Kafir Chops.....		Guarantee	10.25	2.75	2.75	68.75	.....
1967C	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.00	.....
1959A	Milo Chops.....	Wood and Plaster.....	Guarantee	10.00	2.50	3.00	70.50	.....
1959B	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....
1959C	Kafir Chops.....		Guarantee	10.25	2.75	2.75	68.75	.....

HELENA, OKLAHOMA.

213A	Corn Chops.....	{ Helena Milling Co.....	{ Guarantee | 9.00 | 3.00 | 3.00 | 70.00 |
213B	Wheat Bran.....	{	{ Guarantee | 14.50 | 3.50 | 110.00 | 50.00 |

HEMPSTEAD, TEXAS.

52A	Corn Chops.....	{	{ Guarantee | 9.60 | 3.90 |	{ 2.50 | 71.70 |
52B	Cottonseed Meal.....	{	{ Guarantee | 46.00 | 7.00 |	{ 8.00 | 24.00 |
36Y	Cottonseed Meal.....	{ C. Analer's Estate.....	{ Found.... | 48.94 | 7.64 |	{ 6.34 | 23.31 |
52C	Cottonseed Cake.....	{	{ Guarantee | 46.00 | 7.00 |	{ 8.00 | 24.00 |
37Y	Cottonseed Cake.....	{	{ Found.... | 50.19 | 7.64 |	{ 7.69 | 21.73 |
816A	Corn Chops.....	{ A. Fritsch.....	{ Guarantee | 9.00 | 4.00 |	{ 3.00 | 70.00 |
1163A	Corn Chops.....	{ J. M. Norwood.....	{ Guarantee | 9.00 | 3.50 |	{ 3.50 | 70.00 |
385A	Corn Chops.....	{ W. H. Shindler.....	{ Guarantee | 9.00 | 3.50 |	{ 3.50 | 70.00 |

HENDERSON, TEXAS.

124A	Cottonseed Meal.....	{	{ Guarantee | 44.00 | 7.00 |	{ 11.00 | 24.00 |
44Y	Cottonseed Meal.....	{	{ Found.... | 45.83 | 7.76 |	{ 10.20 | 25.16 |
57R	Cottonseed Meal.....	{ Henderson Cotton Oil and	{ Found.... | 43.67 | 6.66 |	{ 10.22 | 25.36 |
124C	Cottonseed Meal and Hulls	{ Gin Co.....	{ Guarantee | 41.00 | 5.00 |	{ 12.00 | 25.00 |
124C	Cottonseed Meal and Hulls	{	{ Found.... | 40.13 | 6.81 |	{ 11.58 | 28.09 |

HENNESSEY, OKLAHOMA.

88A	Corn Chops.....	{	{ Guarantee | 9.00 | 4.00 |	{ 3.00 | 70.00 |
88B	Wheat Mixed Feed.....	{ Star Mill and Elevator Co.....	{ Guarantee | 15.00 | 3.50 |	{ 10.00 | 50.00 |
88C	Wheat Shorts.....	{	{ Guarantee | 14.50 | 3.50 |	{ 5.00 | 60.00 |

HENRIETTA, TEXAS.

1451A	Cottonseed Meal.....	{	{ Guarantee | 44.00 | 7.00 |	{ 11.00 | 24.00 |
1451B	Cottonseed Meal.....	{ Clay County Cotton Oil	{ Found.... | 44.83 | 9.19 |	{ 9.33 | 23.88 |
1451B	Cottonseed Cake.....	{ Co.....	{ Guarantee | 44.00 | 7.00 |	{ 11.00 | 24.00 |

HENRIETTA, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Extract.	Ingredients.	Remarks.
745A	Cottonseed Chops.	Henrietta Elevator Co.	Guarantee	9.00	4.00	3.00	70.00		
745C	Corn Chops and Corn Bran		Guarantee	9.00	3.00	3.50	70.00		
745D	Milo Chops.		Guarantee	9.50	2.50	3.00	71.00		
1014A	Corn Chops.	Henrietta Milling Co.	Guarantee	9.00	4.00	3.00	70.00		
1014B	Wheat Bran and Shorts.		Guarantee	14.50	3.50	10.00	50.00		
1014C	Wheat Bran and Screenings		Guarantee	14.50	4.00	10.00	55.00		
1014D	Mixed Bran.		Guarantee	15.00	4.00	9.00	57.00	Wheat and corn bran.	
1382A	Corn Chops.	James Henry	Guarantee	9.00	3.00	3.00	70.00		

HEREFORD, TEXAS.

271A	Corn Chops.	E. W. Harrison	Guarantee	8.94	3.65	2.13	73.84		
271B	Kafir Chops.		Guarantee	9.00	2.50	2.50	70.00		
271C	Feterita Chops.		Guarantee	11.00	2.50	3.00	69.00		
271C	Feterita Chops.		Found.	13.33	3.00	1.85	70.36		
271B	Milo Chops.		Guarantee	9.00	2.50	2.50	70.00		

HERMANN, MISSOURI.

22A	Wheat Mixed Feed	Eggers Milling Co.	Guarantee	14.50	4.00	8.00	55.00	Wheat bran and shorts.	
22B	Wheat Bran		Guarantee	14.50	3.50	10.00	50.00		
22C	Wheat Shorts.		Guarantee	17.00	3.80	4.50	60.00		
22C	Wheat Shorts		Found.	19.75	5.64	5.82	58.87		

HERMLEIGH, TEXAS.

2169A	Milo Chops.	G. M. Allen.	Guarantee	9.00	2.50	3.00	70.00		
2169A	Milo Chops.		Found.	11.74	3.21	2.19	72.04		

HICO, TEXAS.

545A	Cottonseed Meal and Hulls	Guarantee	40.40	4.64	12.34	27.15	
545A	Cottonseed Meal and Hulls	Found...	40.07	6.55	13.31	27.32	
72B	Cottonseed Meal and Hulls	Found...	48.06	8.17	7.19	22.83	
545B	Cottonseed Cake and Hulls	Guarantee	40.40	4.64	112.34	27.15	
545B	Cottonseed Cake and Hulls	Found...	41.88	6.49	11.54	26.29	
73B	Cottonseed Cake and Hulls	Found...	44.50	7.71	9.53	23.31	
545C	Cottonseed Meal	Guarantee	44.00	7.00	11.00	23.00	
545C	Cottonseed Meal	Found...	46.88	8.06	6.70	24.67	
545D	Cottonseed Meal	Guarantee	44.00	7.00	11.00	23.00	
545D	Cottonseed Meal	Found...	48.32	8.36	6.21	27.89	
545E	Cottonseed Cake Screenings	Guarantee	44.00	6.00	9.00	23.00	
545E	Cottonseed Cake Screenings	Found...	43.94	9.54	8.59	24.37	
74B	Cottonseed Cake Screenings	Found...	44.04	9.76	9.81	22.81	
72A	Corn Chops	Guarantee	9.00	4.00	3.00	70.00	
72B	Dixie Ear Corn Chops	Guarantee	8.65	3.63	6.29	72.05	
46A	Corn Chops	Guarantee	9.00	4.00	3.00	70.00	
46B	Wheat Bran	Guarantee	17.30	3.90	8.40	56.00	
7R	Wheat Bran	Found...	18.29	4.27	8.83	53.83	
46C	Mixed Feed	Guarantee	12.50	3.00	7.00	57.00	Wheat bran and kafir chops
46D	Mixed Feed	Guarantee	13.50	3.50	8.00	60.00	Wheat and corn bran and kafir chops
46E	Mixed Feed No. 3	Guarantee	13.00	3.00	16.00	45.00	Wheat bran and rice hulls
46F	Hog and Cow Feed	Guarantee	11.00	.90	11.25	61.25	Wheat flour and rice hulls
46G	Mixed Feed	Guarantee	10.00	3.00	12.00	45.00	Wheat bran, rice hulls and kafir chops
46H	Mixed Feed	Guarantee	8.00	2.75	5.00	65.00	Corn chops and rice hulls
46I	Mixed Feed	Guarantee	12.00	2.50	12.00	50.00	Wheat bran, rice hulls and flour
46J	Mixed Feed	Guarantee	10.00	4.50	20.00	40.00	Wheat bran, rice hulls and polish
46L	Mixed Feed	Guarantee	12.50	4.00	8.00	59.00	Wheat and corn bran and milo chops
46M	Mixed Chops	Guarantee	9.25	3.00	3.00	70.00	Milo and corn chops
46N	Corn Chops and Corn Bran	Guarantee	9.50	2.75	3.00	71.00	
46O	Mixed Feed	Guarantee	12.50	3.50	8.50	57.00	Wheat and corn bran, milo and cane seed
46P	Kafir Chops	Guarantee	9.50	2.75	3.00	71.00	
46Q	Mixed Bran	Guarantee	14.00	3.50	10.25	52.00	Wheat and corn bran
6R	Mixed Bran	Found...	17.73	4.80	8.27	58.92	

Bencini Cotton Oil Mills.

Shaffer Feed and Produce Co.

J. F. Wieser & Co.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Extract.	Ingredients.	Remarks.
46R	Mixed Feed.....	J. F. Wieser & Co.— Continued.	Guarantee	11.50	3.00	11.00	56.00	Wheat gran, rice hulls and milo chops.	Adulterated Milo and Kafir chops.
46S	Gray Shorts.....		Guarantee	15.00	3.00	5.00	60.00	.....
89B	Gray Shorts.....		Found.....	17.91	3.98	5.46	58.96	.....
46U	Mixed Chops.....		Guarantee	8.50	3.00	5.15	68.00	Corn and milo head chops.	
46V	Milo Head Chops.....		Guarantee	8.09	2.50	8.50	68.00	.....
46W	Red Rooster Chicken Feed.		Guarantee	9.00	3.50	3.00	70.00	Wheat, wheat screenings, corn chops, oats and milo.	
46X	Mixed Feed.....		Guarantee	13.00	3.00	6.00	62.25	Wheat bran, milo and kafir chops.	
HIGGINS, TEXAS.									
1102A	Cottonseed Cake.....	Chambers-Winsett Bros.	Guarantee	44.00	7.00	11.00	22.00	.....
50A	Kafir Chops.....	C. B. Cozart.....	Guarantee	9.00	2.50	3.00	70.00	.....
50B	Corn Chops.....		Guarantee	9.00	3.00	3.50	70.00	.....
1834A	Wheat Chops.....	Gage Roller Mills.....	Guarantee	14.00	2.00	2.00	60.00	.....
2070A	Wheat Bran and Screenings	Gerlach-Higgins Milling Co.	Guarantee	15.00	3.50	9.00	55.00	.....
2070A	Wheat Bran and Screenings		Found.....	18.32	4.23	9.38	50.27	.....
2070B	Wheat Shorts.....		Guarantee	17.00	3.80	4.50	60.00	.....
2070B	Wheat Shorts.....		Found.....	18.00	4.49	3.76	58.99	.....
2070C	Wheat Mixed Feed and Screenings.		Guarantee	16.00	3.50	8.00	55.00	.....
2070C	Wheat Mixed Feed and Screenings.	Gerlach-Higgins Milling Co.	Found.....	17.38	4.28	8.07	52.41	.....
2070D	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....
2070D	Corn Chops.....		Found.....	9.88	4.00	2.17	71.16	.....
2070E	Milo Chops.....		Guarantee	10.00	2.50	3.00	71.00	.....

2070E	Milo Chops.....	Found....	11.19	2.83	2.28	70.29	.....
2070F	Wheat Mixed Feed.....	Guarantee	16.00	3.60	8.00	55.00	Wheat bran and shorts.
2070F	Wheat Mixed Feed.....	Found....	17.25	4.14	7.92	51.87	.....
43P	Corn Chops.....	Found....	10.50	3.99	2.43	70.26	.....
79W	Wheat Shorts.....	Found....	18.53	4.92	4.33	58.93	.....
1882A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	.....
1882B	Wheat Chops.....	Guarantee	14.00	2.00	2.00	60.00	.....
1882C	Kafir Chops.....	Guarantee	10.25	2.75	2.75	68.75	.....
1882D	Milo Chops.....	Guarantee	10.00	2.50	3.00	70.50	.....
27A	Kafir Chops.....	Guarantee	9.50	2.50	3.25	70.00	.....
27B	Wheat Shorts.....	Guarantee	14.75	3.50	5.00	60.00	.....
27C	Wheat Bran.....	Guarantee	14.50	3.50	9.00	51.50	.....
27B	Corn Chops.....	Guarantee	9.00	3.75	3.00	70.00	.....
27E	Wheat and Corn Bran.....	Guarantee	14.50	3.50	10.00	50.00	.....
1540A	Kafir Chops.....	Guarantee	9.50	2.75	3.00	71.00	.....
1540B	Corn Chops.....	Guarantee	9.80	4.09	2.60	72.78	.....

HIGGINSVILLE, MISSOURI.

766A	Corn Chops.....	Guarantee	9.00	3.50	2.79	67.63	.....
766B	Wheat Bran.....	Guarantee	14.37	3.63	10.98	52.60	.....
766C	Wheat Shorts.....	Guarantee	16.37	4.86	5.00	57.75	.....
168A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	.....
168B	Wheat Bran.....	Guarantee	14.50	3.50	10.00	50.00	.....
80R	Wheat Bran.....	Found....	17.17	3.68	10.46	52.35	.....
168D	Wheat Shorts.....	Guarantee	18.30	4.87	4.50	59.69	.....
168E	Wheat Mixed Feed.....	Guarantee	15.58	3.27	8.29	58.67	Wheat bran and shorts.

HILLSBORO, TEXAS

292A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	20.00	.....
15B	Cottonseed Meal.....	Found....	43.57	6.23	12.02	26.14	.....
99I	Cottonseed Meal.....	Found....	39.69	6.91	13.58	25.53	.....
292B	Ideal Mixed Feed.....	Guarantee	9.25	2.50	44.00	32.00	Cottonseed hulls and meal.
							Adulterated hulls.
							Adulterated hulls.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen Free Extract.	Ingredients.	Remarks.
292C	Hillsboro Mixed Feed.....	Hill County Cotton Oil Co. —Continued.	Guarantee	10.50	2.75	40.00	30.00	Cottonseed hulls and meal.	
292D	Woodall's Horse and Mule Feed.		Guarantee	13.00	2.50	36.00	37.00	Cottonseed hulls and meal.	
292E	Screened Cottonseed Cake..		Guarantee	44.00	7.00	11.00	20.00		
16B	Screened Cottonseed Cake..		Found....	41.32	6.57	11.69	25.35		Adulterated hulls.
46W	Screened Cottonseed Cake..		Found....	40.00	7.12	13.04	25.01		Adulterated hulls.
80B	Screened Cottonseed Cake..		Found....	40.75	6.89	12.43	26.30		Adulterated hulls.
1782A	Wheat Bran.....	Marvel Mill Co.....	Guarantee	15.00	3.50	10.00	54.00		
1782B	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00		
1782C	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.00		
1782D	Favorite Chicken Feed.....		Guarantee	10.00	2.50	3.50	68.00	Ground milo, corn chops and wheat screenings.	
1782D	Favorite Chicken Feed.....		Found....	11.13	3.08	2.72	70.31		
2115A	Corn Chops.....	W. R. Newton.....	Guarantee	9.50	3.50	3.00	70.00		
2115A	Corn Chops.....		Found....	8.86	4.40	2.09	71.23		
2115B	Ear Corn Chops.....		Guarantee	8.00	3.00	7.50	64.00		
2115B	Ear Corn Chops.....		Found....	8.10	4.00	6.03	69.13		
2115C	Mixed Feed.....		Guarantee	12.00	3.00	8.50	56.00	Ear corn chops, wheat bran and cottonseed meal.	
2115C	Mixed Feed.....		Found....	13.31	3.63	7.78	60.56		
HOBART, OKLAHOMA.									
767A	True Blood's Mixed Feed...	Alfalfa Milling Co.....	Guarantee	13.75	1.95	19.37	48.50	Corn, wheat bran and alfalfa hay...	
767B	Alfalfa Mixed Feed.....		Guarantee	12.00	3.00	22.00	47.00	Corn chops, kafir, oats and alfalfa meal	
767C	Known Mixed Feed.....		Guarantee	13.00	2.00	30.00	41.00	Cottonseed meal and hulls, wheat bran and alfalfa meal.	
767D	Alfalfa Meal.....		Guarantee	13.50	1.50	35.00	30.00		

598A	Corn Chops.....	{	Guarantee	9.00	4.00	3.00	70.00	.....
598B	Wheat Mixed Feed.....	{	Guarantee	14.50	3.12	10.00	50.00	Wheat bran and shorts.....
598C	Mixed Feed.....	{	Guarantee	13.00	3.50	7.50	55.00	Corn and wheat bran.....
598D	Wheat Shorts.....	{						
598E	Mixed Feed.....	{	Guarantee	12.00	3.00	6.50	61.50	Wheat bran and ground kafir.....

HOLDENVILLE, OKLAHOMA.

1188A	Corn Chops.....	{	Holdenville Grain and Pro-duce Co.	Guarantee	9.00	3.50	3.50	70.00
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HOLLIS, OKLAHOMA.

1916C	Cottonseed Meal and Hulls	{	Guarantee	39.00	7.00	12.00	23.00
1916C	Cottonseed Meal and Hulls	{	Found....	40.57	7.02	11.28	28.45	.....
1916D	Cottonseed Cake and Hulls	{	Guarantee	39.00	7.00	12.00	23.00	.....
1916D	Cottonseed Cake and Hulls	{	Found....	42.28	6.56	10.79	28.65	.....

HONDO, TEXAS.

374A	Corn Chops.....	{	J. W. Holloway.....	Guarantee	9.00	3.50	3.00	70.00	.....
731A	Corn Chops.....	{	Hondo Gin & Mill Co....	Guarantee	9.00	3.00	3.00	70.00	.....
731B	Corn Bran.....	{		Guarantee	7.50	4.00	16.00	60.00	.....

HONEY GROVE, TEXAS.

1778A	Corn Chops and Corn Bran...	{	W. H. Dowlen & Sons.....	Guarantee	9.00	3.00	3.00	70.00	.....
499A	Cottonseed Meal.....	{		Guarantee	45.00	6.00	11.00	20.00	.....
73Y	Cottonseed Meal.....	{		Found....	41.69	6.24	11.55	26.74	.....
114Y	Cottonseed Meal.....	{	Honey Grove Cotton Oil	Found....	40.85	6.56	11.80	27.02	.....
115Y	Cottonseed Meal.....	{	Co.	Found....	40.25	6.80	11.75	26.82	.....
499B	Cottonseed Meal and Hulls	{		Guarantee	36.00	5.00	12.00	20.00	.....
499B	Cottonseed Meal and Hulls	{		Found....	41.17	6.30	11.38	26.96	.....

Adulterated hulls.
Adulterated hulls.
Adulterated hulls.

TEXAS AGRICULTURAL EXPERIMENT STATION.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen Free Extract.	Ingredients.	Remarks.
86A	Corn Chops.....	Acme Feed Mill.....	Guarantee	9.00	3.50	3.00	65.00	.....	.....
86E	American Stock Mixed Feed.....		Guarantee	7.50	3.00	18.50	45.00	Alfalfa, rice bran, salt, rice hulls, ear corn chops and molasses.	.....
86E	Irish Stock Feed.....		Guarantee	8.00	3.50	13.00	48.00	Alfalfa, rice bran and hulls. corn chops, salt and molasses.	.....
86H	Gold Medal Mixed Feed.....		Guarantee	10.50	4.00	15.00	50.00	Alfalfa hay, rice bran, salt, milo and corn chops and molasses.	.....
86I	H. C. F. Mixed Feed.....		Guarantee	11.50	3.50	13.00	53.00	Alfalfa hay, wheat bran, salt, milo. corn chops and oats.	.....
86D	Acme Mill Corn Feed Meal.....		Guarantee	8.00	2.00	2.00	70.00	.....	.....
86K	Comet Mixed Feed.....		Guarantee	10.00	5.50	16.00	50.00	Alfalfa, rice bran, corn chops, oats, salt and molasses.	.....
86J	Square Deal Mixed Feed.....		Guarantee	10.00	3.00	15.00	49.00	Alfalfa, wheat bran, rice bran, ear corn chops, salt and oats.	.....
86L	Ear Corn Chops.....		Guarantee	8.00	2.50	8.00	60.00	.....	.....
86M	Milo Chops.....		Guarantee	9.00	2.50	3.50	70.00	.....	.....
86N	Acme Mixed Feed.....		Guarantee	9.00	3.00	16.00	49.00	Alfalfa hay and meal, wheat bran, ground rice hulls, corn and milo chops, salt and molasses.	.....
86N	Acme Mixed Feed.....	American Brewing Association.	Found.....	9.31	1.87	14.48	52.76	.....	.....
1666A	Dried Brewers' Grain.....		Guarantee	25.00	5.90	14.37	35.00	.....	.....
1053A	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....	.....
1053B	Pointer Brand Mixed Feed.....		Guarantee	14.00	5.00	14.00	63.00	Corn and wheat bran, corn chops, alfalfa hay and cottonseed meal.	.....
1053C	Ground Oats.....		Guarantee	10.00	5.00	18.00	53.00	.....	.....
1053D	Mixed Bran.....		Guarantee	12.50	7.00	14.00	46.00	Wheat and rice bran.	.....
1053E	Magnolia Mixed Stock Feed.....		Guarantee	12.00	4.50	10.00	58.00	Corn and Wheat bran, corn chops, alfalfa hay, cottonseed meal and molasses.	.....

1063F	Magnolia No. 2.....	Guarantee	12.00	4.50	10.00	58.00	Brewers' grain, corn chops, wheat bran, alfalfa hay, cottonseed meal and molasses.
729A	Cottonseed Meal and Hulls	Guarantee	42.00	7.00	8.00	20.00	.....
729C	Rice Bran.....	Guarantee	11.00	10.00	12.00	45.00	.....
729D	Rice Polish.....	Guarantee	13.00	8.00	3.00	50.00	.....
729F	Rice Bran and Hulls.....	Guarantee	10.79	10.11	15.00	43.02	.....
729G	Peanut Hulls and Cottonseed Meal.	Guarantee	13.67	2.87	45.66	19.52	.....
1010A	Cranston's Own Mixed Feed	Guarantee	12.15	3.13	10.52	58.37	Corn chops, wheat bran, alfalfa hay, oats and salt.
1010B	Cranston's Corn Chops.....	Guarantee	9.00	3.50	3.00	68.00	.....
1010C	Cranston's Corn Feed Meal.	Guarantee	9.00	3.00	3.00	68.00	.....
1010D	Chicken Feed.....	Guarantee	10.00	2.50	5.00	60.00	Corn, wheat, milo, chops.
1010F	Blue Bird Mixed Feed.....	Guarantee	13.10	4.69	13.37	49.48	Corn chops, wheat and rice bran, alfalfa hay and salt.
1010G	Cranston's Milo Chops.....	Guarantee	9.50	2.50	3.00	70.00	.....
1010H	Cranston's Own Wheat Bran and Milo Mixture.	Guarantee	12.36	2.78	5.85	53.49	.....
870A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	.....
870B	Wheat Bran and Rice Polish	Guarantee	13.50	5.50	6.00	55.00	.....
870C	Ground Oats and Corn Chops.	Guarantee	10.00	3.50	9.00	58.00	.....
870D	Ground Oats.....	Guarantee	10.00	3.50	9.00	58.00	.....
870E	Corn Feed Meal.....	Guarantee	9.00	3.50	3.00	70.00	.....
870F	Mixed Stock Feed.....	Guarantee	9.00	5.00	15.43	49.85	Alfalfa hay, rice bran and hulls, corn chops, molasses and salt
870G	Economy Stock Feed.....	Guarantee	13.24	4.08	10.70	56.92	Wheat and corn bran, ground oats corn chops, alfalfa and cottonseed meal.
870H	Economy Molasses Stock Feed.	Guarantee	11.03	4.02	13.54	61.46	Alfalfa and cottonseed meal, corn chops, corn and rice bran, ground oats and molasses.
870I	Economy Dairy Feed.....	Guarantee	16.35	4.85	12.57	53.64	Alfalfa and cottonseed meal, corn and wheat bran, ground oats and molasses.

D. S. Cunge & Co.....

Oliver Cranston.....

E. S. Dixon & Co.....

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Insoluble Nitrogen.	Ingredients.	Remarks.
870J	Mixed Chicken Feed	E. S. Dixon & Co.—Cont'd	Guarantee	12.24	4.06	2.89	67.37	Wheat, corn, kafir, milo chops and broken rice.	
870K	Alfalfa Meal and Molasses ..		Guarantee	13.36	2.02	21.23	49.52	.....
870L	Star Brand Mixed Feed		Guarantee	14.50	2.01	12.36	58.80	Corn chops, molasses, alfalfa and cottonseed meal.	
870M	Milo Chops.....		Guarantee	9.00	3.00	3.50	70.00	.....
870N	Economy Molasses Stock Feed No. 2.		Guarantee	11.22	1.82	11.76	54.00	Alfalfa and cottonseed meal, corn chops, corn bran, milo, kafir, ground oats, molasses and salt.	
76A	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....
76B	Cottonseed Meal		Guarantee	44.00	7.00	11.00	22.00	.....
76C	Cottonseed Meal and Hulls ..		Guarantee	36.00	8.00	11.00	22.00	.....
76D	Corn Feed Meal.....		Guarantee	7.00	2.50	5.00	70.00	.....
76E	Buffalo Stock Feed with Peat		Guarantee	9.00	3.00	14.00	50.00	Corn chops, milo head chops, alfalfa meal, rice bran, oat screenings, molasses, salt and peat.	
22Y	Buffalo Stock Feed with Peat.		Found	8.81	.80	8.19	63.91	.....
76F	Magnolia Stock Feed with Peat.		Guarantee	9.00	1.75	24.00	40.00	Molasses, alfalfa, cottonseed hulls and meal, oat screenings, peat and salt.	
76G	Ground Oats.....	J. E. Ervine & Co	Guarantee	10.00	3.00	9.00	58.00	.....
76H	Wheat Bran.....		Guarantee	14.50	3.00	10.00	50.00	.....
76I	Corn and Kafir Chops		Guarantee	9.00	2.50	3.50	65.00	.....
76J	Kafir Head Chops and Molasses.		Guarantee	9.00	2.50	9.00	65.00	.....
76L	Alfalfa Meal.....		Guarantee	13.00	1.50	32.00	35.00	.....
76M	Magnolia Poultry Feed.....		Guarantee	10.00	2.50	4.00	70.00	Wheat, kafir, milo, rice, corn chops ..	
76N	Kafir Head Chops		Guarantee	9.00	2.50	10.00	65.00	.....

HOUSTON, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Ex- tract.	Ingredients.	Remarks.
1153B	Mixed Bran.....	Houston Grain Co.—Cont.	Guarantee	13.50	7.00	10.00	45.00	Rice and wheat bran and salt.	
1153C	Corn Chops.....		Guarantee	9.00	3.00	3.00	65.00		
1153D	Germ-N-Micks Stock Feed		Guarantee	10.50	6.00	15.00	45.00	Rice bran, molasses, corn chops, alfalfa and salt.	
20Y	Germ-N-Micks Stock Feed		Found....	11.00	6.38	11.79	49.95		
1153E	Texina Stock Feed.....		Guarantee	9.20	5.00	15.00	45.00	Corn chops, alfalfa, rice bran and hulls, molasses and salt.	
1153F	Chick-Micks.....		Guarantee	12.00	1.50	3.00	65.00	Wheat, milo, corn and corn chops.	
1153G	Rolled Oats.....		Guarantee	11.00	4.50	9.75	58.00		
1153H	Chicks-Micks, Jr.....		Guarantee	11.00	2.50	5.00	60.00	Kafir, milo, wheat chops.	
1153I	Milo and Kafir Chops.....		Guarantee	9.00	3.00	3.50	70.00		
1153J	U. S. Brand Mixed Stock Feed.		Guarantee	13.50	4.00	10.00	50.00	Wheat and corn bran, corn chops, cut alfalfa and salt.	
1153J	U. S. Brand Mixed Stock Feed.	Houston Ice and Brewing Co.	Found....	15.51	4.43	10.00	53.86		
19Y	U. S. Brand Mixed Stock Feed.		Found....	13.63	4.47	10.62	54.64		
1153K	Milo and Kafir Meal.....		Guarantee	9.00	3.50	3.00	70.00		
1153K	Milo and Kafir Meal.....		Found....	11.06	2.91	2.05	68.94		
1153L	Corn Feed Meal.....		Guarantee	9.00	3.00	3.00	65.00		
1153L	Corn Feed Meal.....		Found....	9.31	5.52	2.30	68.20		
1165A	Dry Brewers' Grain.....	Houston Ice and Brewing Co.	Guarantee	20.00	5.50	19.00	45.00		
927A	Ideal Stock Feed.....		Guarantee	10.80	6.00	9.00	50.00	Corn chops, alfalfa, wheat bran, rice bran and salt.	
927B	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00		
927C	Screened Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00		
927D	Corn Feed Meal.....		Guarantee	8.00	3.50	3.00	70.00		
927E	Mixed Bran.....		Guarantee	14.00	7.00	10.00	45.00	Wheat and rice bran and salt.	

927G	Ideal Stock Feed.....	Guarantee	13.25	4.00	9.00	54.75	Corn bran, corn chops, wheat bran, alfalfa hay and salt.
927H	Corn Bran.....	Guarantee	8.00	4.00	11.00	60.00	
927J	Ideal Stock Feed.....	Guarantee	13.00	4.00	10.75	50.00	Corn chops, wheat and corn bran, alfalfa hay and salt.
21Y	Ideal Stock Feed.....	Found.....	14.50	4.45	9.66	56.78	
927K	Star Stock Feed.....	Guarantee	11.25	13.00	45.25		Corn chops, rice and wheat bran, alfalfa hay and salt.
927L	Ideal Poultry Feed.....	Guarantee	11.00	3.00	3.00	64.00	Milo, wheat, corn chops, pepper seed and rough rice.
927M	Milo Chops.....	Guarantee	9.00	2.50	3.50	65.00	
927N	King Bee Molasses Stock Feed.....	Guarantee	11.00	4.00	7.00	59.00	Milo chops, rice and wheat bran, alfalfa hay, molasses and salt.
927N	King Bee Molasses Stock Feed.....	Found.....	11.29	4.02	7.76	58.99	
927O	Milo Meal.....	Guarantee	8.00	4.00	3.00	68.00	
927O	Milo Meal.....	Found.....	7.96	4.21	2.34	70.14	
1765A	Blood Meal.....	Guarantee	70.00	.50	3.00	3.00	
1765B	High Protein Meat Scraps for Poultry.....	Guarantee	65.00	12.00	3.50	5.00	
1283A	Rice Polish.....	Guarantee	10.00	8.00	4.00	50.00	
1283B	Rice Bran.....	Guarantee	11.00	10.00	12.00	45.00	
262A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	23.00	
25R	Cottonseed Meal.....	Found.....	45.56	6.81	10.70	24.98	
26R	Cottonseed Meal.....	Found.....	45.07	7.35	11.24	23.94	
262B	Bolted Cottonseed Meal and Hulls.....	Guarantee	44.00	7.00	12.00	23.00	
262B	Bolted Cottonseed Meal and Hulls.....	Found.....	45.50	7.45	8.97	25.07	
262D	Bolted Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	23.00	
262B	Bolted Cottonseed Meal.....	Found.....	45.99	7.22	9.72	25.27	
1048A	Rice Polish.....	Guarantee	12.00	7.00	3.50	60.00	
1048A	Rice Polish.....	Found.....	12.88	9.84	2.87	59.75	
1048B	Rice Bran.....	Guarantee	11.50	10.50	12.00	46.00	
1048B	Rice Bran.....	Found.....	13.60	16.44	8.93	48.20	
54R	Rice Bran.....	Found.....	13.78	15.87	9.07	42.24	

Houston Milling Co.....

Houston Packing Co.....

Imperial Rice Co.....

Industrial Cotton Oil Properties.

Industrial Mill.....

HOUSTON, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Moisture.	Ingredients.	Remarks.
384B	Our Special Chicken Feed.....	O. P. Jackson & Co.....	Guarantee	9.00	3.50	3.00	70.00	Milo, corn, kafir, wheat, oats, grit, corn chops, sunflower and foreign seed.	
1985A	Corn Chops.....	Jennings Bros.....	Guarantee	9.00	3.50	3.00	70.00	.....
1985B	Diamond J. Stock Feed.....		Guarantee	13.00	3.00	6.00	6.000	Milo chops, crushed oats and wheat bran.	
1985C	Crushed Oats.....		Guarantee	11.00	3.15	6.00	60.00	.....
719A	Cottonseed Meal.....	J. G. Leavell Co.....	Guarantee	44.00	7.00	11.00	20.00	.....
1835A	Each Day an Egg Chicken Feed.....	Julius Levy.....	Guarantee	9.00	3.00	3.00	68.00	.....
1841A	Veribest Chicken Food with Shell.....	Lilienthal Bros.....	Guarantee	9.00	3.50	3.00	70.00	Kafir, milo, wheat, clean rice, wheat screenings, corn chops, rough rice, oats, sunflower seed and shell.	
1842B	Special Mixed Chicken Feed.....	Lindsay Bros.....	Guarantee	10.50	2.05	2.25	67.00	.....
750A	Cottonseed Meal.....	Magnolia Cotton Oil Co. {	Guarantee	44.00	7.00	11.00	20.00	.....	Adulterated hulls. Adulterated hulls.
13Y	Cottonseed Meal.....		Found.....	43.13	7.25	11.79	26.31	.....
27R	Cottonseed Meal.....		Found.....	39.94	8.25	12.52	16.01	.....
466A	Cottonseed Meal.....	Merchants and Planters { Oil Co.	Guarantee	45.00	6.00	11.00	24.00	.....
11Y	Cottonseed Meal.....		Found.....	47.00	9.71	7.88	23.91	.....
2136A	Laying Mash.....	Moers Seed Co.....	Guarantee	18.00	3.00	9.00	55.00	Wheat and corn bran, wheat shorts, alfalfa and cottonseed meal, beef scraps, rolled oats and blood meal	
2136A	Laying Mash.....		Found.....	18.81	4.2	6.87	54.8	.....
2136B	Chick Feed.....		Guarantee	10.00	2.75	5.00	65.00	Wheat, corn, kafir, milo cracked, millet and steel cut oats.	

2136B	Chick Feed.....	Found.....	11.88	3.79	3.58	67.42	.....	Wheat, cracked corn, kafir, milo,
2136C	Scratch Feed.....	Guarantee	10.00	2.50	3.00	65.00	.....	sunflower and buckwheat seed.
		Found.....	11.06	3.29	3.03	69.02	.....
617A	Rice Polish.....	Guarantee	11.00	6.00	4.00	50.00	.....
617B	Rice Bran.....	Guarantee	11.00	10.00	15.00	44.00	.....
55R	Rice Bran.....	Found.....	12.06	10.57	13.04	43.88	.....
617C	Ground Rice Hulls.....	Guarantee	3.00	.50	37.00	37.00	.....
704A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	.....
704B	Mixed Feed.....	Guarantee	9.00	1.00	19.00	51.00	.....	Wheat bran, ground corncob and corn.
704C	Ear Corn Chops.....	Guarantee	7.00	2.40	7.00	63.00	.....
704D	Dan Patch.....	Guarantee	9.00	1.00	17.00	55.00	.....	Ear corn chops, alfalfa and cottonseed meal, brewers' grain and salt.
704E	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	24.00	.....
1275A	Rice Meal.....	Guarantee	11.00	10.00	15.00	45.00	.....
1275B	Rice Bran.....	Guarantee	11.00	10.00	15.00	40.00	.....
1275C	Robinson's Rice Bran and Molasses.....	Guarantee	10.00	9.00	15.00	50.00	.....
1869A	Mixed Chicken Feed.....	Guarantee	9.00	3.50	3.00	70.00	.....	Wheat, milo and corn chops.
1295A	Rice Bran.....	Guarantee	11.56	10.60	12.00	42.87	.....
1295B	Rice Bran.....	Guarantee	11.50	12.50	12.00	42.00	.....
1295C	Rice Bran.....	Guarantee	13.00	14.00	10.00	48.00	.....
1295D	Rice Polish.....	Guarantee	12.00	12.00	6.00	43.00	.....
1295E	Rice Cone Meal.....	Guarantee	12.00	12.00	6.00	43.00	.....
1293A	Queen Mixed Feed.....	Guarantee	11.02	4.00	12.50	50.37	.....	Corn chops, alfalfa hay, rice and wheat bran.
1293B	Queen Chicken Feed.....	Guarantee	10.00	3.50	5.20	63.15	.....	Wheat, kafir, milo, corn chops and rice.
1293C	Queen Stock Mixed Feed.....	Guarantee	13.50	4.00	12.50	50.37	.....	Alfalfa hay, wheat and corn bran, corn chops and salt.
1293C	Queen Stock Mixed Feed.....	Found.....	12.84	4.12	9.82	56.59	.....

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Moisture.	Ingredients.	Remarks.
1785A	Ground Red Rice.....	Southern Rice Growers Association.	Guarantee	8.00	1.50	8.00	60.00	.....	.....
1218A	Cottonseed Meal.....		Guarantee	44.00	7.00	9.00	22.00	.....	.....
214A	Corn Chops.....	South Texas Cotton Oil Co.	Guarantee	9.00	3.50	3.00	70.00	.....	.....
214B	Wheat Shorts, Wheat Bran and Screenings.		Guarantee	14.00	4.00	9.00	55.00	.....	.....
214B	Wheat Shorts, Wheat Bran and Screenings.		Found....	14.04	4.43	9.97	57.95	.....	.....
214C	Corn Feed Meal.....		Guarantee	10.00	5.50	4.50	63.00	.....	.....
214D	No. 4 Corn Chops.....		Guarantee	9.00	3.50	3.50	65.00	.....	.....
214E	Wheat Shorts and Screenings		Guarantee	15.00	3.50	6.50	60.00	.....	.....
214E	Wheat Shorts and Screenings		Found....	15.31	4.36	7.51	57.80	.....	.....
214F	Mixed Chops.....		Guarantee	9.00	3.00	3.50	65.00	Corn and kafir chops.....	.....
214J	(Ground Rice.....		Guarantee	7.00	1.75	8.00	65.00	.....	.....
214M	Ear Corn Chops.....		Guarantee	8.00	3.00	8.00	65.00	.....	.....
214N	Rollod Oats.....		Guarantee	11.00	4.50	9.75	58.00	.....	.....
214O	Sotex Stock Feed.....		Guarantee	13.00	2.75	17.00	50.00	Rollod oats, corn chops, salt alfalfa and cottonseed meal.	.....
214P	Poultry Feed.....		Guarantee	10.00	3.00	3.00	65.00	Wheat, corn grits, milo, cracked rice, oats and mixed seed.	.....
214Q	Egaday Poultry Feed.....		Guarantee	10.00	2.00	2.50	66.00	Corn chops, wheat, milo, cracked rice and oats.	.....
214R	ST Stock Feed.....		Guarantee	10.25	1.75	13.75	50.00	Molasses, alfalfa and cottonseed meal, corn chops, ground mill screenings and salt.	.....
214S	Corn Bran.....	South Texas Grain Co.	Guarantee	9.00	5.50	5.75	60.00	.....	.....
214T	Milo Chops.....		Guarantee	9.00	2.50	3.50	65.00	.....	.....
214U	Rice Bran.....		Guarantee	11.00	10.00	12.00	42.00	.....	.....
214V	Mixed Chops.....		Guarantee	9.00	3.00	2.50	70.00	Corn and milo chops.....	.....

[illegible]

HOWE, TEXAS.

45A	Corn Chops.....	Bean Grain Co.....	Guarantee	9.00	4.00	3.00	70.00
355A	Corn Chops.....	Howe Grain and Mercantile Co.	Guarantee	9.00	4.00	3.00	70.00
355B	Kafir Chops.....		Guarantee	9.00	3.00	3.00	70.00
355C	Corn and Kafir Chops.....		Guarantee	9.00	3.00	3.00	70.00
355D	Oat and Corn Chops.....		Guarantee	8.00	4.00	8.00	60.00
355E	Howe Milk Maker Mixed Feed.....		Guarantee	11.00	4.50	30.00	40.00
355F	Eureka Horse Feed.....		Guarantee	14.00	3.00	18.00	42.00
355G	Mixed Feed.....		Guarantee	14.00	3.00	18.00	40.00
355H	Purity Mixed Stock Feed...		Guarantee	10.00	4.00	8.00	60.00
355I	Eureka Hog Feed.....		Guarantee	15.00	6.00	7.00	70.00
355J	Milo Chops.....		Guarantee	9.00	2.50	3.50	70.00

HOWE, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Hydrogen React.	Ingredients.	Remarks.
355K	Poultry Food.....	Howe Grain and Mercantile Co. C.—continued	Guarantee	10.75	2.75	3.75	68.25	Milo, kafir, corn and wheat screenings.	
355L	Baby Chick Food.....		Guarantee	10.75	2.75	3.75	68.75	Wheat, millet and cane seed, milo and kafir chops.	
1601A	Milky Way Dairy Feed....	J. A. Hughes Grain Co.....	Guarantee	16.00	6.00	20.00	44.00	Cottonseed meal and hulls, wheat, corn and rice bran.	
1601B	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....
1601C	Our Favorite Hog Feed....		Guarantee	15.00	5.50	8.00	50.00	Wheat shorts, corn and cottonseed meal, rice bran.	
1601D	Our Favorite Cow Feed....		Guarantee	12.00	3.50	30.00	35.00	Wheat, corn, rice bran, cottonseed meal and hulls.	
1601E	Chick Feed with Oyster Shells.		Guarantee	10.41	2.81	4.09	64.62	Millet, oyster shell, wheat screenings, milo and corn chops.	
1601F	Hughes Favorite Dairy Feed.		Guarantee	18.00	3.50	18.00	42.00	Wheat and corn bran, cottonseed meal and hulls.	
1601G	Our Prepared Cow Feed....	Hubbard City Mill and Elevator Co.	Guarantee	15.00	3.00	15.00	49.00	Cottonseed meal and hulls, wheat bran and milo chops.	
1601G	Our Prepared Cow Feed....		Found.	16.19	3.26	11.31	55.08	.....
1601H	Amazing Cow Feed.....		Guarantee	17.00	3.50	7.50	50.00	.....
1601H	Amazing Cow Feed.....		Found.	18.49	3.77	5.55	57.40	.....
1601I	Our Summer Cow Feed....		Guarantee	16.00	3.00	23.00	40.00	Wheat bran, cottonseed meal and hulls.	

HUBBARD CITY, TEXAS

237A	Corn Chops.....	Hubbard City Mill and Elevator Co.	Guarantee	9.00	3.40	3.00	70.00	.....
237B	Corn Bran.....		Guarantee	9.00	2.40	12.00	55.00	.....
343A	Cottonseed Meal.....	Hubbard Oil Co.....	Guarantee	44.00	7.00	11.00	20.00	.....
69B	Cottonseed Meal.....		Found.	43.50	6.73	11.19	25.38	.....

Adulterated hulls.

343B	Cottonseed Cake.	{	Guarantee	44.00	7.00	11.00	20.00	
59B	Cottonseed Cake.	{	Found . . .	41.09	6.56	12.05	25.67	
1008A	Corn Chops.	{	Guarantee	9.00	4.00	3.00	70.00	
601A	Corn Chops.	{	Guarantee	9.00	4.00	3.00	70.00	

HUGO, OKLAHOMA.

1937A	Corn and Kafr Chops.	{	Guarantee	9.50	3.10	3.25	69.00	
1937B	Corn Chops.	{	Guarantee	9.54	3.99	2.58	70.89	

HULVER, TEXAS.

1913A	Corn and Milo Chops.	{	Guarantee	9.50	3.00	3.00	70.25	
1913B	Corn Chops.	{	Guarantee	9.00	3.50	3.00	70.00	
1913C	Milo Chops.	{	Guarantee	10.00	2.50	3.00	70.50	

HUMBY, TEXAS.

1625A	Mixed Feed.	{	Guarantee	14.00	2.00	6.00	50.50	Milo and oats . . .
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HUNTSVILLE, TEXAS.

143A	Cottonseed Meal.	{	Guarantee	44.00	7.00	11.00	25.00	
143B	Corn Chops.	{	Guarantee	9.00	2.50	3.00	70.00	
1312A	Corn Chops.	{	Guarantee	9.00	3.00	3.50	70.00	

HUTCHINS, TEXAS.

1469A	Corn Chops.	{	Guarantee	9.00	3.50	3.00	70.00	
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HUTCHINSON, KANSAS.

1347A	Corn Chops.	{	Guarantee	9.00	3.00	3.50	70.00	
1347B	Wheat Shorts.	{	Guarantee	15.50	4.00	6.00	55.00	
101P	Wheat Shorts.	{	Found . . .	18.61	4.77	5.56	55.75	

HUTCHINSON, KANSAS—Continued

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen.	Ingredients.	Remarks.
88P 1347C 88P 1347D 1347E 1347E	Wheat Shorts. Wheat Mixed Feed. Wheat Mixed Feed. Wheat Bran. Wheat Mixed Feed and Screenings. Wheat Mixed Feed and Screenings.	Hutchinson Flour Mill Co. —Continued.	Found.... Guarantee Found.... Guarantee Found....	17.60 15.50 16.16 15.00 15.50	4.48 3.50 4.34 3.50 3.50	5.96 9.00 8.65 10.10 9.00	57.60 50.00 54.54 50.00 50.00	..... Wheat bran and shorts. Wheat, bran, shorts and screenings	.....
526B 526C 526D	Standard Wheat Shorts. Wheat Bran and Screenings Wheat Mixed Feed and Screenings.	William Kelly Milling Co..	Guarantee Guarantee Guarantee	16.00 14.50 16.00	3.50 3.50 3.50	5.50 10.00 8.50	55.00 50.00 50.00	..... ..... Wheat bran, shorts and screenings	.....
957A 957B 957C	Corn Chops. Wheat Bran and Millrun Screenings. Wheat Shorts with Millrun Screenings.	Larabee Flour Mills Co. . .	Guarantee Guarantee Guarantee	9.00 14.50 16.00	3.90 3.50 3.50	2.20 10.00 5.50	68.00 54.00 54.00	...............	.....
957D 957E 957G	Corn Chops and Corn Bran Wheat Mixed Feed and Screenings. Germil-O-Mixed Feed.		Guarantee Guarantee Guarantee	9.00 16.00 14.00	3.50 3.50 3.80	3.50 8.50 8.50	70.00 54.00 54.00	..... Wheat bran, shorts and screenings. Wheat bran, corn chops, wheat shorts, barley chops and oil meal.	.....
957I	Wheat Mixed Feed.	Monarch Milling Co.	Guarantee	14.50	3.50	8.50	54.00	Wheat bran and shorts.	.....
994A 994B 994C	Wheat Bran. Wheat Mixed Feed. Wheat Shorts.		Guarantee Guarantee Guarantee	14.50 15.00 15.50	3.50 3.50 3.50	10.50 8.00 6.00	50.00 55.00 60.00	..... Wheat bran and shorts. .....	.....

INDEPENDENCE, MISSOURI.

94A	Corn Chops.....	Waggoner Gates Mill Co..	{ Guarantee	8.00	2.00	3.00	70.00	.....
94B	Mixed Feed.....		{ Guarantee	15.00	5.00	9.00	55.00	Bran shipstuf and shorts.....

INGRAM, TEXAS.

1291A	Corn Chops.....	{ Guarantee | 9.00 | 3.00 | 3.50 | 70.00 |	.....
1291B	Milo Chops.....	{ Guarantee | 10.00 | 2.50 | 3.00 | 71.00 |	.....
1291B	Milo Chops.....	{ Found ... | 10.25 | 2.79 | 2.35 | 72.24 |	.....

INMAN, KANSAS.

1274A	Wheat Mixed Feed.....	{ Guarantee | 14.00 | 3.50 | 9.50 | 50.00 |	Wheat bran and shorts.....
1274B	Wheat Shorts.....	{ Guarantee | 15.00 | 4.00 | 5.00 | 55.00 |	.....
1274C	Wheat Bran and Screenings	{ Guarantee | 14.00 | 3.50 | 9.50 | 55.00 |	.....

IOWA PARK, TEXAS.

488A	Corn Chops.....	{ Guarantee | 9.50 | 3.50 | 3.00 | 70.00 |	.....
488A	Corn Chops.....	{ Found ... | 9.57 | 4.11 | 2.18 | 69.84 |	.....
488B	Milo Chops.....	{ Guarantee | 10.00 | 2.50 | 3.00 | 71.00 |	.....
488B	Milo Chops.....	{ Found ... | 10.38 | 2.28 | 2.03 | 70.69 |	.....
828A	Corn Chops.....	{ Guarantee | 9.00 | 4.00 | 3.00 | 70.00 |	.....

ITALY, TEXAS.

518A	Cottonseed Meal.....	{ Guarantee | 45.00 | 6.00 | 11.00 | 24.00 |	.....
17B	Cottonseed Meal.....	{ Found ... | 42.93 | 6.77 | 11.96 | 25.06 |	.....

Adulterated hulls.

ITASCA, TEXAS.

519A	Cottonseed Meal.....	{ Guarantee | 45.00 | 6.00 | 11.00 | 22.00 |	.....
26B	Cottonseed Meal.....	{ Found ... | 43.29 | 7.29 | 10.40 | 23.66 |	.....
519B	Cottonseed Cake.....	{ Guarantee | 45.00 | 6.00 | 11.00 | 22.00 |	.....

ITASCA, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen in Extract	Ingredients.	Remarks.
28A	Corn Chops.....	Itasca Roller Mills and Elevator Co.	Guarantee	9.19	3.90	2.34	71.71	.....
28B	Mixed Bran.....		Guarantee	15.50	3.75	8.00	60.00	Wheat and corn bran.....	
28C	Milo and Kafir Chops.....		Guarantee	9.00	2.75	3.00	70.00	.....
28D	Mixed Feed.....		Guarantee	12.50	3.40	7.00	62.00	Wheat bran, milo and kafir chops.....	

JACKSBORO, TEXAS.

436A	Corn Chops.....	E. L. Douglass.....	Guarantee	9.00	4.00	3.00	70.00	.....
209A	Corn Chops.....	Jacksboro Mill and Elevator Co.	Guarantee	9.00	3.00	3.00	70.00	.....
209B	Wheat Bran.....		Guarantee	16.00	3.00	9.00	50.00	.....
209C	Wheat and Corn Bran.....		Guarantee	13.00	4.00	10.00	60.00	.....
209D	Wheat Bran and Kafir Meal.....		Guarantee	13.00	4.00	8.25	60.00	.....
209E	Milo Chops.....		Guarantee	10.00	2.50	3.00	71.00	.....
326A	Cottonseed Meal.....	Jacksboro Oil and Milling Foundry	Found.....	44.00	7.00	11.00	230.00	.....	Adulterated hulls.
87R	Cottonseed Meal.....		Found.....	38.13	9.03	13.80	26.19	.....
88R	Cottonseed Meal.....		Found.....	43.16	11.36	10.18	22.81	.....
19P	Cottonseed Meal.....		Found.....	42.18	6.32	12.31	25.47	.....
326B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	20.00	.....

JACKSON, MISSOURI.

736A	Wheat Mixed Feed.....	Cape County Milling Co.....	Guarantee	14.00	4.00	10.00	50.00	Wheat bran and shorts.....
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JACKSONVILLE, TEXAS.

2029A	Cowpeas and Hull Chops.....	Devereux Bros.....	Guarantee	18.00	1.25	4.50	55.00
2029A	Cowpeas and Hull Chops.....		Found.....	21.89	1.39	4.28	57.70	.....

1599A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	24.00	.....
50R	Cottonseed Meal.....	Found....	42.57	9.20	9.66	25.46	.....
1599B	Damaged Cottonseed Meal.....	Guarantee	43.00	7.00	8.00	24.00	.....
1599C	Damaged Cottonseed Cake.....	Guarantee	43.00	7.00	8.00	24.00	.....
1599D	Cottonseed Meal and Hulls.....	Guarantee	37.00	8.00	14.00	24.00	.....
1599E	Cottonseed Meal and Hulls.....	Guarantee	41.50	6.00	12.00	22.00	.....
1599E	Cottonseed Meal and Hulls.....	Found....	44.29	8.10	9.52	25.25	.....
1599F	Mixed Feed.....	Guarantee	12.00	1.85	33.00	38.00	Cottonseed hulls and meal.....
1599F	Mixed Feed.....	Found....	10.00	1.99	35.35	40.52	.....
1859A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	.....
1859B	Mixed Chops.....	Guarantee	9.00	3.00	3.25	70.00	Corn and milo chops.....
1859C	Acme Corn Chops and Corn Bran.....	Guarantee	9.00	3.50	3.25	69.50	.....
1859H	Mixed Feed.....	Guarantee	9.50	4.50	31.00	47.00	Wheat and rice bran, and rice hulls.....
1859H	Mixed Feed.....	Found....	10.27	1.75	24.21	41.92	.....
1898A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	.....

JEFFERSON, TEXAS.

2048A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.90	24.00	.....
2048A	Cottonseed Meal.....	Found....	46.38	7.65	8.02	24.54	.....
46Y	Cottonseed Meal.....	Found....	44.32	7.89	8.34	26.62	.....
2048B	Cottonseed Cake.....	Guarantee	44.00	7.00	11.00	24.00	.....
2048B	Cottonseed Cake.....	Found....	44.57	7.06	8.33	26.29	.....

JEFFERSON, OKLAHOMA.

1924A	Wheat Bran.....	Guarantee	14.50	3.50	10.00	50.95	.....
1924B	Standard Wheat Shorts.....	Guarantee	14.59	3.00	3.50	56.00	.....
1924C	Wheat Mixed Feed.....	Guarantee	16.50	4.50	7.20	56.05

JETT, OKLAHOMA.

971A	Corn Chops.....	Guarantee	9.00	3.00	3.00	69.00
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JOHNSON CITY, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen.	Ex- tract.	Ingredients.	Remarks.
1610A	Wheat Bran and Shorts.....	Johnson City Roller Flour Mill.	Guarantee	18.30	3.50	6.80	61.00			

JONAH, TEXAS.

408A	Corn Chops.....	{ Jonah Roller Mills..... }	Guarantee	9.00	4.00	3.00	70.00			
408B	Corn Bran.....		Guarantee	8.50	5.00	11.00	60.00			
408C	Wheat Bran.....		Guarantee	16.50	4.50	9.00	50.00			

JOPLIN, MISSOURI.

1416A	Corn Chops.....	J. W. Boyd Grain and Com- mission Co.	Guarantee	9.00	3.00	3.50	68.50			
1376A	Dunwoody's Best Wheat Bran	Brand-Dunwoody Milling Co.	Guarantee	14.00	3.30	10.00	50.00			
1082A	Corn Chops.....	Hanna-Pate Grain Co.....	Guarantee	8.90	3.50	3.30	69.00			

JOURDANTON, TEXAS.

2156A	Corn Chops.....	{ Steinle and Steinle..... }	Guarantee	9.50	3.50	3.00	70.00			
2156A	Corn Chops.....		Found	9.94	3.83	2.14	73.22			

JUNCTION CITY, KANSAS.

5A	Best Yet Wheat Bran	Hogan Milling Co.....	Guarantee	14.00	3.50	10.00	50.00			
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JUSTIN, TEXAS.

1328A	Corn Chops.....	W. J. Black.....	Guarantee	9.00	3.50	3.50	70.00			
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KANSAS CITY, MISSOURI.

30A	Corn Chops.....	{	Guarantee	9.25	4.17	2.18	71.99	
30B	Wheat Bran.....		Guarantee	15.87	3.56	9.00	56.39	
30C	Mixed Bran.....		Guarantee	16.00	3.05	10.00	53.00	Wheat and corn bran.
30D	Wheat Shorts.....		Guarantee	18.00	4.50	4.00	60.00	
Justin Mill and Elevator Co.								
194A	Corn Chops.....	{	Guarantee	9.00	3.50	3.00	70.00	
194B	Atlas Mixed Feed.....		Guarantee	7.50	4.00	13.01	62.75	Corn, oat hulls, oat shorts and salt..
74A	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	
74B	Wheat Bran.....		Guarantee	15.00	3.50	10.00	50.00	
74C	Wheat Shorts.....	{	Guarantee	15.50	3.50	4.00	60.00	
74D	Alfalfa Meal.....		Guarantee	12.50	1.90	25.20	39.50	
Fowler Commission Co....								
1487A	Corn Chops.....	{	Guarantee	9.00	3.00	3.50	70.00	
85A	Corn Chops.....	{	Guarantee	9.00	3.00	3.50	70.00	
85B	Wheat Bran.....		Guarantee	14.50	3.00	10.00	50.00	
Hall-Baker Grain Co.....								
1684A	Wheat Mixed Feed and Screenings.	{	Guarantee	16.00	3.00	9.00	49.00	Wheat, bran shorts and screenings..
1684B	Wheat Bran and Screenings	{	Guarantee	14.50	3.00	9.00	49.00	
1684C	White Shorts and Wheat Screenings.		Guarantee	15.00	3.00	6.00	50.00	
1684D	Standard Shorts and Wheat Screenings.	{	Guarantee	15.00	3.00	6.00	50.00	
1684E	White Middlings and Wheat Screenings.	{	Guarantee	16.00	3.00	5.00	50.00	
1684F	Gray Shorts and Wheat Screenings.		Guarantee	15.00	3.00	6.00	50.00	
Kansas City Flour Mills Co.								
1811A	Corn Chops.....	{	Guarantee	9.00	3.50	3.00	70.00	
1811B	Wheat Bran.....		Guarantee	14.50	4.00	9.50	53.50	
Katy Grain Co.....								
205A	Wheat Bran.....	{	Guarantee	14.50	3.50	10.00	50.00	
205B	Wheat Shorts.....		Guarantee	14.50	3.50	5.00	60.00	
205C	Winter Wheat Bran.....		Guarantee	15.00	3.50	9.00	53.00	
205D	Winter Wheat Shorts.....		Guarantee	17.00	4.50	5.00	56.00	
Kelly Milling Co.....								

KANSAS CITY, MISSOURI—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen Free Extract.	Ingredients.	Remarks.
205E	Wheat Chops.....	Kelly Milling Co.—Cont'd	Guarantee	15.00	3.00	5.00	62.00		
205F	Red Dog.....		Guarantee	13.00	1.50	2.00	68.00		
205G	Wheat Bran and Screenings		Guarantee	15.00	3.50	9.00	53.00		
157A	Wheat Bran.....	Kemper Mill and Elevator Co.	Guarantee	14.50	4.00	9.50	53.50		
157B	Wheat Shorts.....		Guarantee	15.50	5.00	4.00	60.25		
157C	Corn Chops.....		Guarantee	9.00	4.00	3.00	72.25		
157D	Wheat Bran and Shorts.....		Guarantee	14.75	4.00	9.50	53.75		
157E	Wheat Shorts and Ground Screenings.		Guarantee	15.00	4.00	8.00	56.50		
157F	Wheat Bran and Ground Screenings.		Guarantee	14.50	4.00	9.50	53.50		
1386A	Wheat Bran.....	R. E. Kidder Flour Mill...	Guarantee	14.50	3.50	10.00	50.00		
1386B	Wheat Shorts.....		Guarantee	15.00	4.00	6.00	50.00		
1386C	Wheat Bran and Screenings		Guarantee	14.50	3.50	10.00	50.00		
981A	Corn Chops.....	Kimball-Sawyer Milling Co.	Guarantee	9.00	3.50	3.50	70.00		
981B	Wheat Bran.....		Guarantee	15.00	3.00	10.00	50.00		
981C	Wheat Shorts.....		Guarantee	16.00	4.00	5.00	55.00		
981D	Prepared Poultry Feed.....		Guarantee	13.00	2.50	4.00	70.00	Corn chops, wheat and kafir.	
981E	Kafir Chops.....		Guarantee	10.00	2.50	3.00	70.00		
946A	Kornfalfa Feed.....		Guarantee	12.00	4.00	10.00	58.00	Alfalfa, corn, oats and salt.	
946B	Prime Alfalfa Meal.....		Guarantee	14.00	1.50	30.00	37.00		
946C	Pioneer Alfalfa Meal.....		Guarantee	14.00	2.00	25.00	45.00		
946D	Pioneer Alfalfa Meal.....		Guarantee	15.00	1.60	27.00	37.00		
946E	Kakle Poultry Feed, Chick Size.		Guarantee	9.50	3.50	4.00	65.00	Wheat, corn, kafir and millet.	
946F	Kakle Poultry Feed, Scratch Size.		Guarantee	10.00	3.25	12.00	55.00	Wheat, corn, kafir, sunflower seed and buckwheat.	

946G	Kornfalfa Kandy Feed.....	Guarantee	9.00	2.50	12.00	55.00	Corn, oats, alfalfa meal and molasses
946H	Kracker Molasses Feed. . .	Guarantee	8.00	2.00	12.50	45.00	Corn, cob meal, straws, molasses and alfalfa.
946I	Kawmo Molasses Feed.	Guarantee	9.00	2.50	12.00	55.00	Corn, oats, alfalfa meal and molasses
946J	Alfalfa Molasses Feed.	Guarantee	9.00	1.00	25.00	45.00	Alfalfa meal and molasses.....
946K	Krow Scratch Feed with Grit.	Guarantee	10.00	3.25	4.50	60.00	Kafir, milo, wheat, corn, buckwheat and grit.
946L	Krow Chick Feed.	Guarantee	8.50	3.50	4.00	65.00	Corn, kafir, milo, wheat and millet.
946M	Krow Chick Feed with Grit	Guarantee	8.50	3.50	4.00	65.00	Corn, kafir, milo, wheat, millet and grit.
946N	Kay Molasses Feed.	Guarantee	8.00	1.50	17.00	50.00	Corn, oats, alfalfa meal and molasses
946O	Krow Scratch Feed.	Guarantee	10.00	3.25	4.50	60.00	Corn, kafir, wheat and buckwheat..
1244A	Wheat Shorts.	Guarantee	14.00	4.50	5.00	65.00	.....
1244B	Wheat Bran.	Guarantee	14.11	3.50	9.00	58.00	.....
1244C	Corn Chops.	Guarantee	8.18	3.45	3.50	68.20	.....
760A	Corn Chops.	Guarantee	9.00	3.00	3.00	70.00	.....
760B	Alpha Meal-O.	Guarantee	9.50	1.30	15.00	60.00	Alfalfa meal and molasses.
760C	Wheat Shorts.	Guarantee	15.50	5.00	4.00	60.25	.....
760D	Wheat Bran.	Guarantee	14.50	4.00	9.50	53.50	.....
2121A	Sanco Chick Feed.	Guarantee	10.00	3.00	3.00	60.00	Corn, kafir, milo, wheat chops, cane and millet seed.
2121A	Sanco Chick Feed.	Found	12.84	2.54	2.55	68.29	.....
2121B	Sanco Scratch Feed.	Guarantee	10.00	2.50	3.00	65.00	Corn chops, kafir, milo, wheat, barley, oats and sunflower seed.
2121D	Sanco Scratch Feed.	Found	10.31	3.63	4.59	66.93	.....
647A	Wheat Bran.	Guarantee	14.50	3.50	10.00	50.00	.....
647B	Wheat Shorts.	Guarantee	14.50	3.50	5.00	60.00	.....
83B	Wheat Bran.	Guarantee	14.50	3.50	10.00	50.00	.....
83C	Wheat Shorts.	Guarantee	14.50	3.50	5.00	60.00	.....
1334A	White Wheat Middling and Ground Screenings.	Guarantee	16.86	3.00	3.50	63.00	.....
1334B	Wheat Bran and Ground Screenings.	Guarantee	17.00	3.50	10.00	49.00	.....

KANSAS CITY, MISSOURI—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Ex- tract.	Ingredients.	Remarks.
1334C	Brown Wheat Shorts and Ground Screenings.	Southwestern Milling Co. —Continued.	Guarantee	17.50	4.00	6.90	52.60		
1334D	Gray Wheat Shorts and Ground Screenings.		Guarantee	17.40	3.50	5.60	55.60		
1334E	Wheat Mixed Feed and Ground Screenings.		Guarantee	17.25	4.00	8.50	53.65	Wheat, bran, shorts and screenings.	
764A	Cherry's Alfalmo and Fat.	Stock Yard Cotton and Lin- seed Meal Co.	Guarantee	11.25	.81	13.78	46.31	Alfalfa meal and sugar beet sirup.	
764B	Cherry's Alfalmo and Fat.		Guarantee	10.00	1.00	25.00	40.00	Alfalfa meal and molasses.	
1749A	Tarkio Molasses Feed No. 1 with Humus.	Tarkio Molasses Feed Co.	Guarantee	9.00	3.00	7.00	56.00	Cane molasses, ground bolted flax screenings, wheat bran, ground corn and humus.	
1749B	Tarkio Champion Molasses Feed No. 2 with Humus.		Guarantee	7.00	2.00	8.00	54.00	Cane molasses, wheat and flax screenings, wheat bran and humus	
1749C	Tarkio Molasses Mixed Feed with Humus.		Guarantee	9.00	2.00	7.00	56.00	Cane molasses, ground flax and grain screenings, corn wheat bran and charred humus.	
1646A	Alfalfa Molasses Feed.	United States Stock Food Co.	Guarantee	9.00	1.00	16.00	48.00	Molasses and alfalfa meal.	
1646B	Eagle Brand Dairy Feed.		Guarantee	10.00	3.00	14.00	50.00	Corn, alfalfa meal and molasses.	
1646C	Eagle Brand Horse and Mule Feed.		Guarantee	9.50	3.00	11.00	55.00	Corn, oats, alfalfa meal and molasses	
1281A	Corn Chops.	Western Grain Co.	Guarantee	9.00	3.00	3.50	70.00		
1281B	Wheat Bran.		Guarantee	14.50	3.50	10.00	50.00		
2065A	Corn Chops.	T. P. Okeefe.	Guarantee	9.50	3.50	3.00	70.00		
2065A	Corn Chops.		Found.	10.38	3.71	2.46	71.07		
1475A	Corn Chops.		Guarantee	9.00	3.50	3.00	70.00		

KARNES CITY, TEXAS.

KATY, TEXAS.

673A	Rice Polish.....	{	Guarantee	12.05	7.05	4.00	70.00	
673B	Rice Bran.....	{	Guarantee	13.00	10.00	10.00	50.00	

KAUFMAN, TEXAS.

2032A	Corn Chops.....	{	Guarantee	9.00	3.50	3.00	70.00	
2032A	Corn Chops.....	{	Found	11.01	4.00	2.68	770.87	
2032B	Mixed Feed.....	{	Guarantee	9.00	3.25	6.00	65.00	Corn chops and crushed oats.....
2032B	Mixed Feed.....	{	Found	11.36	4.47	5.85	66.57	
607A	Cottonseed Meal.....	{	Guarantee	44.00	7.00	11.00	24.00	
607B	Cottonseed Meal.....	{	Found	43.88	7.99	10.22	24.87	
607B	Cottonseed Cake.....	{	Guarantee	44.00	7.00	11.00	24.00	
63B	Cottonseed Cake.....	{	Found	43.92	6.66	10.03	26.50	
607C	Mixed Feed.....	{	Guarantee	8.50	1.75	40.00	37.00	Cottonseed hulls and meal.....
118Y	Mixed Feed.....	{	Found	8.04	1.53	44.47	32.47	
607D	Mixed Feed.....	{	Guarantee	10.00	1.25	44.00	27.00	Cottonseed hulls and meal.....
607F	Cottonseed Meal and Hulls	{	Guarantee	36.00	6.00	17.50	23.00	
607F	Cottonseed Meal and Hulls	{	Found	37.29	8.44	11.58	30.95	
607G	Cottonseed Cake and Hulls	{	Guarantee	36.00	6.00	17.50	23.00	
607G	Cottonseed Cake and Hulls	{	Found	36.82	7.73	12.72	29.73	

Excess hulls.

KAW CITY, OKLAHOMA.

1097A	Corn Chops.....	{	Guarantee	9.00	3.50	3.00	70.00	
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KENEDY, TEXAS.

557A	Cottonseed Meal.....	{	Guarantee	44.00	7.00	11.00	20.00	
7T	Cottonseed Meal.....	{	Found	46.45	8.09	9.12	25.28	
557B	Cottonseed Cake.....	{	Guarantee	44.00	7.00	11.00	20.00	
2093A	Corn Chops.....	{	Guarantee	9.00	3.50	3.00	70.00	
2093A	Corn Chops.....	{	Found	10.00	4.08	3.34	70.36	
2093B	Ear Corn Chops.....	{	Guarantee	8.00	3.00	8.00	60.00	
2093B	Ear Corn Chops.....	{	Found	10.15	3.48	8.30	67.10	
2093C	Milo Chops.....	{	Guarantee	9.00	3.00	3.00	70.00	

KENEDY, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Grude Fiber.	Nitro- gen- Extrac.	Ingredients.	Remarks.
2093C	Milo Chops.....	Kenedy Feed Co.—Cont'd	Found....	10.88	2.76	2.40	70.95		
2093D	Corn Cob.....		Guarantee	2.00	.50	31.00	54.00		
2093D	Corn Cob.....		Found....	2.38	2.7	34.05	55.17		
1852A	Corn Chops.....	U. S. Standles.....	Guarantee	9.00	4.00	3.00	70.00		

KENNARD, TEXAS.

1901A	Cottonseed Meal.....	Y. O. McAdams.....	Guarantee	44.00	7.00	11.00	22.00		
1901B	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00		
1901C	Milo Chops.....		Guarantee	8.50	3.00	1.75	70.00		

KERENS, TEXAS.

1698A	Corn Chops.....	W. J. Carroll.....	Guarantee	9.00	3.50	3.00	70.00		
2027A	Corn Chops.....	Inmon & Gregory.....	Guarantee	9.50	3.50	3.00	71.00		
2027A	Corn Chops.....		Found....	9.87	4.04	2.46	70.53		
500B	Cottonseed Cake.....	Kerens Cotton Oil Co.....	Guarantee	44.00	6.50	9.00	22.00		
500C	Cottonseed Meal and Hulls		Guarantee	44.00	6.50	12.00	22.00		
61B	Cottonseed Meal and Hulls		Found....	38.22	14.76	11.23	23.64		

KERRYVILLE, TEXAS.

162A	Corn Chops.....	Kerryville Roller Mill.....	Guarantee	9.00	3.00	3.00	70.00		
104T	Corn Chops.....		Found....	9.75	4.34	2.38	70.08		
162B	Corn Bran.....		Guarantee	10.00	3.00	12.00	55.00		
162C	Wheat Bran.....	Kerryville Roller Mill.....	Guarantee	14.50	4.00	10.00	50.00		
162D	Wheat Shorts.....		Guarantee	15.00	4.00	5.00	60.00		

KILLEEN, TEXAS.

1593A	Corn Chops.	H. M. Cox Milling Co.	Guarantee	9.00	3.50	3.00	70.00	
2086A	Corn Chops.	C. W. Gregory.	Guarantee	9.00	3.50	3.00	70.00	
2086A	Corn Chops.		Found	9.44	4.44	2.45	70.85	
2086B	Corn Bran.		Guarantee	8.00	3.00	12.00	60.00	
2086B	Corn Bran.		Found	8.81	3.22	8.50	66.40	
2086C	Corn, Ear Chops.		Guarantee	8.00	3.00	7.50	64.00	
2086C	Corn, Ear Chops.		Found	8.25	2.91	8.79	66.82	
2086G	Ear Corn Chops with Shucks		Guarantee	7.75	2.75	10.00	62.00	
2086G	Ear Corn Chops with Shucks		Found	8.69	3.50	8.91	64.49	
910A	Corn Chops.	H. D. Massey	Guarantee	9.00	4.00	3.00	70.00	
1819A	Corn Chops.	Massey & Gregory	Guarantee	9.00	3.50	3.00	70.00	
2173A	Corn Chops.	T. J. Sikes	Guarantee	9.00	3.50	3.00	70.00	
2173A	Corn Chops.		Found	9.94	4.24	2.70	69.61	

KINGFISHER, OKLAHOMA.

96A	Corn Chops.	Kingfisher Mill and Elevator Co.	Guarantee	9.00	3.80	2.50	70.00	
96B	Wheat Bran.		Guarantee	16.00	4.00	10.00	55.00	
96C	Wheat Shorts.		Guarantee	16.00	4.50	4.50	60.00	
96D	Mixed Feed.		Guarantee	14.00	3.75	10.00	57.00	Wheat bran and kafir meal.
89A	Corn Chops.	Oklahoma Mill Co.	Guarantee	9.00	3.50	3.00	70.00	
89B	Wheat Mixed Feed.		Guarantee	15.00	3.50	9.00	50.00	Wheat bran and shorts.
89C	Wheat Shorts.		Guarantee	14.50	3.50	5.00	60.00	

KINGSVILLE, TEXAS.

2015A	Corn Chops.	City Feed Store.	Guarantee	9.00	3.50	3.00	70.00	
2015A	Corn Chops.		Found	10.75	4.46	2.41	70.32	
1680A	Corn Chops.	City Grain and Feed Co.	Guarantee	9.00	3.50	3.00	70.00	
1680B	Kafir Chops.		Guarantee	9.00	2.50	3.50	71.00	
1680C	Milo Chops.		Guarantee	9.00	2.50	3.50	71.00	

KINGSVILLE, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen	Ex- tract.	Ingredients.	Remarks.
1315C	Corn Chops.	Kingsville Cotton Oil Mill Co.	Guarantee	9.00	3.50	3.00	70.00	.....	.....	.....
1315C	Corn Chops.		Found.....	10.69	4.28	1.95	69.82	.....	.....	.....
2137A	Corn Chops.	J. W. Schlinke.....	Guarantee	9.50	3.50	3.00	70.00	.....	.....	.....
2137A	Corn Chops.		Found.....	10.25	4.24	2.24	69.27	.....	.....	.....
2137B	Ear Corn Chops without Shuck.		Guarantee	8.00	3.00	7.50	64.00	.....	.....	.....
2137B	Ear Corn Chops without Shuck.		Found.....	8.88	3.33	8.95	65.86

KIRVEN, TEXAS.

1809A	Corn Chops.	A. V. Kelly.	Guarantee	9.00	3.50	3.00	70.00
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KNOX CITY, TEXAS.

1970A	Corn Chops.	J. H. Davis Elevator Co.	Guarantee	9.00	3.50	3.00	70.00
1970B	Milo Chops.		Guarantee	9.50	2.50	2.25	70.00	.....	.....	.....
1076A	Cold Pressed Cottonseed	Knox City Cotton Oil Mill	Guarantee	28.00	5.30	24.00	31.00	.....	.....	.....
36W	Cold Pressed Cottonseed		Found.....	28.87	7.74	22.30	29.24	.....	.....	.....

KOSSE, TEXAS.

1728A	Cottonseed Meal	Farmers' Cotton Oil Co.	Guarantee	44.00	7.00	11.00	23.00	.....	.....	.....
1728A	Cottonseed Meal		Found.....	47.36	7.28	6.45	26.72	.....	.....	.....

KRESS, TEXAS.

1474A	Corn Chops.		Guarantee	9.00	3.50	3.00	70.00	.....	.....	.....
1474B	Milo Chops.		Guarantee	9.00	2.50	3.00	70.00	.....	.....	.....

1474C	Kafir Chops.....	{	Kress Mill.....	{	Guarantee	9.50	2.75	3.00	71.00
1474D	Milo Head Chops.....	{		{	Guarantee	10.00	2.50	8.00	69.00
1474D	Milo Head Chops.....	{		{	Found.	10.56	2.55	7.09	66.25

KRUM, TEXAS.

1396A	Wheat Chops.....	{		{	Guarantee	13.00	2.00	5.00	60.00
1396B	Corn Chops.....	{		{	Guarantee	9.00	3.50	3.00	70.00
1396C	Wheat and Oat Chops.....	{	R. L. Cole & Co.....	{	Guarantee	12.00	2.75	8.50	57.00
1396E	Mixed Feed.....	{		{	Guarantee	9.50	3.25	3.25	69.50
1396F	Ground Wheat Screenings ..	{		{	Guarantee	14.50	2.00	5.50	64.00
1396G	Milo Chops.....	{		{	Guarantee	10.00	3.00	3.00	70.50

KYLE, TEXAS.

1631A	Corn and Cob Meal.....	{	J. G. Heibenneich.....	{	Guarantee	8.40	3.50	8.00	60.00
1631B	Corn Chops.....	{		{	Guarantee	9.00	3.90	3.00	70.00
513A	Cottonseed Meal.....	{		{	Guarantee	44.00	7.00	11.00	24.00
3B	Cottonseed Meal.....	{	Kyle Oil and Gin Co.....	{	Found.	46.38	7.78	8.89	25.08
513B	Cottonseed Cake.....	{		{	Guarantee	44.00	7.00	11.00	24.00

LADONIA, TEXAS.

511A	Cottonseed Meal.....	{	Ladonia Cotton Oil Co....	{	Guarantee	44.00	7.00	11.00	24.00
511B	Cottonseed Cake.....	{		{	Guarantee	44.00	7.00	11.00	24.00

LAFONTAINE, KANSAS.

1356A	Corn Chops.....	{	Hampton Bros. Milling Co..	{	Guarantee	9.00	3.50	3.50	70.00
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LA GRANGE, TEXAS.

218A	Cottonseed Meal.....	{		{	Guarantee	44.00	7.00	11.00	24.00
24T	Cottonseed Meal.....	{	La Grange Cotton Oil and	{	Found.	45.44	8.30	9.10	25.10
218B	Cottonseed Cake.....	{	Manufacturing Co.....	{	Guarantee	44.00	7.00	11.00	24.00
458A	Corn Chops.....	{	La Grange Ginning and	{	Guarantee	9.50	3.60	2.44	69.18
458B	Corn and Cob Chops.....	{	Milling Co.....	{	Guarantee	8.50	3.00	6.50	70.00

LA JUNTA, COLORADO.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen in Dry Matter.	Ingredients.	Remarks.
1294A	Wheat Mixed Feed	La Junta Mill and Elevator Co.	Guarantee	15.06	2.36	10.00	50.25	.....	.....
1294B	Wheat Mixed Feed and Screenings.		Guarantee	15.50	3.50	10.00	50.00	.....	.....

LAKE CHARLES, LOUISIANA.

1763A	Corn Chops	Lake Charles Grain Co.	Guarantee	9.50	4.00	3.50	68.00	.....	.....
1454B	Rice Polish	Lake Charles Rice Milling Co.	Guarantee	12.00	7.00	3.50	60.00	.....	.....
1454B	Rice Polish		Found.	17.07	16.17	3.44	46.48	.....	.....
1756A	Corn Chops .....	.....	Guarantee	9.00	3.50	3.00	70.00	.....	.....
1756B	Winner Mixed Feed		Guarantee	10.00	4.00	12.00	50.00	Corn chops, rice bran, alfalfa, oat or barley screenings, or clippings, and molasses.	.....
1756C	Laymore Chicken Feed	Louisiana Grain and Mill- ing Co.	Guarantee	10.00	2.00	10.00	50.00	Cracked corn, rough rice and milo...	.....
1756D	Acme Mixed Feed		Guarantee	10.00	4.00	12.00	55.00	Corn chops, oats, oat feed, alfalfa meal, rice bran and molasses.	.....
1756F	Hog Feed	W. D. Marshall Co.	Guarantee	10.00	4.00	12.00	48.00	Alfalfa meal, rice bran and molasses	.....
1748A	Steam Cooked Pelican Dairy Feed.		Guarantee	16.00	6.00	12.00	48.00	Brewers' grain, rice bran, alfalfa and molasses.	.....
1748B	Steamed Cooked Pelican Feed.	.....	Guarantee	10.00	4.00	12.00	50.00	Corn, brewers' grain, rice bran, al- falfa and molasses.	.....

LAKESIDE, TEXAS.

507A	Rice Polish	Lakeside Rice Mill Co.	Guarantee	12.00	9.00	3.00	55.00
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LAKEVIEW, TEXAS.

1966A	Milo Head Chops.....	Enoch Elland.....	Guarantee 9.50 2.25 7.50 65.00
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LAMAR, COLORADO.

1776A	Wheat Mixed Feed and Screenings.	{ Lamar Milling and Elevator Co.	Guarantee 15.00 3.00 10.00 55.00	Wheat bran shorts and screenings..
1776B	Wheat Bran and Screenings		Guarantee | 15.00 | 3.00 | 10.00 | 55.00 |	

LAMAR, MISSOURI.

1307A	Corn Chops.....	Moran Milling Co.....	Guarantee 9.00 3.50 3.00 70.00
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LAMARQUE, TEXAS.

626A	Corn Chops.....	A. L. Bogatto.....	Guarantee 9.00 4.00 3.00 70.00
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LAMESA, TEXAS.

2078A	Milo Chops.....	{ Key & Key.....	Guarantee 10.00 2.50 3.00 71.00
2078A	Milo Chops.....		Found. 9.28 2.80 2.39 74.33
1083A	Milo Chops.....	J. E. Oquinn.....	Guarantee | 9.00 | 2.50 | 3.00 | 70.00 |
1410A	Crushed Milo Heads.....	J. N. Watson.....	Guarantee | 9.50 | 2.50 | 7.50 | 62.00 |

LAMONT, OKLAHOMA.

805A	Alfalfa Meal.....	Lamont Alfalfa Milling Co.....	Guarantee 14.00 3.20 27.00 34.00
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LAMPASAS, TEXAS.

1862A	Corn Chops.....	Herndon Produce Co.....	Guarantee 9.00 3.50 3.00 70.00
102A	Corn Chops.....	{ Lampasas Milling Co.....	Guarantee | 9.00 | 3.50 | 3.00 | 72.00 |
102B	Wheat Bran.....		Guarantee | 14.50 | 3.00 | 10.00 | 54.00 |
102C	Mixed Bran.....		Guarantee | 14.00 | 4.00 | 9.00 | 54.00 |
102D	Mixed Feed.....		Guarantee | 12.00 | 3.00 | 6.50 | 61.50 |

LAMPASAS, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Ex- tract.	Ingredients.	Remarks.
102E	Milo Chops.....	Lampasas Milling Co.— Continued.	Guarantee	9.50	2.50	3.00	75.00		
102F	Wheat Bran and Screenings		Guarantee	16.00	3.60	8.00	55.00		
102F	Wheat Bran and Screenings		Found.....	16.62	3.61	6.32	56.50		
2117A	Corn Chops.....	J. R. McComb.	Guarantee	9.50	3.50	3.00	70.00		
2117A	Corn Chops.....		Found.....	10.38	4.32	2.68	69.92		
715A	Corn Chops.....	W. S. Morris.....	Guarantee	9.00	4.00	3.00	70.00		

LANCASTER, TEXAS.

504A	Cottonseed Meal.....	Citizens Cotton Oil Co.....	Guarantee	44.00	7.00	11.00	23.00		
504B	XX-Cel Mixed Feed.....		Guarantee	10.50	2.75	40.00	32.00	Cottonseed hulls and meal.	

LAREDO, TEXAS.

751B	Wheat Bran.....	J. Armengol.....	Guarantee	14.50	3.50	10.00	50.00		
1735A	Wheat Bran.....	Laredo Roller Mills.....	Guarantee	14.50	3.00	10.00	52.00		
728A	Wheat Bran.....	Sames, Moore & Co.....	Guarantee	14.00	4.50	10.00	50.00		
2166A	Wheat Bran.....	Texas-Mexican Milling Co. {	Guarantee	15.00	3.50	9.00	54.00		
2166A	Wheat Bran.....		Found.....	18.82	3.83	7.73	54.50		
748A	Wheat Bran.....	L. Villegas.....	Guarantee	14.50	3.50	10.00	50.00		
952A	Wheat Bran.....	Wormer Bros.....	Guarantee	14.00	4.50	10.90	50.00		

LAWRENCE, KANSAS.

476B	Wheat Bran	Bowersock Mills and Power Co.	Guarantee	14.50	4.11	10.82	53.59
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LAWTON, OKLAHOMA.

296A	Corn Chops.	Lawton Mill and Elevator Co.	Guarantee	9.00	4.00	3.00	70.00
296B	Wheat Bran		Guarantee	14.05	3.50	10.00	50.00
296C	Corn and Kafir Chops.		Guarantee	9.00	3.00	3.00	70.00
296D	Wheat Shorts and Kafir Chops.		Guarantee	12.00	2.00	4.25	55.00
296E	Wheat Bran and Kafir Chops		Guarantee	12.00	3.00	7.75	55.00

LEAKY, TEXAS.

1223A	Corn Chops.	W. H. Dunlany.	Guarantee	9.00	3.00	3.50	70.00
1447A	Milo Head Chops.	Tom Price.	Guarantee	9.00	2.00	7.00	62.00
1447B	Ear Corn Chops.		Guarantee	8.00	2.00	12.00	65.00
1447C	Corn Chops.		Guarantee	9.00	3.00	3.00	70.00

LEAVENWORTH, KANSAS.

1192A	Corn Chops.	Ashby & Sons.	Guarantee	9.00	3.50	3.50	70.00
1362B	Wheat Bran	Leavenworth Milling Co.	Guarantee	14.00	3.60	10.00	53.50
196A	Wheat Bran	J. C. Lysle Milling Co.	Guarantee	15.00	4.00	10.00	52.00
196B	Wheat Shorts		Guarantee	14.50	4.50	5.00	54.00
196C	Wheat Bran and Screenings		Guarantee	15.00	4.00	10.00	52.00
1983A	Corn Chops.	Wilson-Leger Hay and Grain Co.	Guarantee	9.00	3.50	3.00	70.00

LEHIGH, KANSAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Extract.	Ingredients.	Remarks.
1755A	Wheat Shorts.....	Groening Bros.....	Guarantee	16.00	3.50	5.00	54.00	.....	.....
1755B	Wheat Bran and Screenings.....		Guarantee	15.00	3.25	10.00	50.00	.....	.....
1755C	Wheat Mixed Feed.....		Guarantee	15.00	3.00	9.00	55.00	Wheat bran and shorts.....	.....

LEMING, TEXAS.

1709A	Duplex Corn Chops.....	Espey & Skowortz Milling Co.	Guarantee	9.00	3.50	3.00	70.00	.....	.....
1709B	Plantation Corn Bran.....		Guarantee	8.00	3.00	12.00	60.00	.....	.....
1933A	Corn Chops.....	Stanush Brothers.....	Guarantee	9.00	3.50	3.00	70.00	.....	.....
1933B	Corn Bran.....		Guarantee	9.00	5.00	10.50	63.00	.....	.....

LEON, OKLAHOMA.

752A	Corn Chops.....	Leon Gin and Milling Co. ..	Guarantee	9.00	4.00	3.00	70.00
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LEONARD, TEXAS.

789A	Wheat Bran.....	Acme Roller Mills.....	Guarantee	14.50	4.50	10.00	50.00
789B	Corn Chops.....		Guarantee	9.00	3.50	3.50	70.00	.....	.....
2181A	Corn Chops.....	James A. Bates.....	Guarantee	9.50	3.50	3.00	70.00	.....	.....
2181A	Corn Chops.....		Found.....	9.31	4.43	2.11	72.39	.....	.....
1253A	Corn Chops.....	Black and Braly.....	Guarantee	9.00	4.00	3.00	70.00	.....	.....
848A	Corn Chops.....	J. C. Christian.....	Guarantee	9.00	4.00	3.00	70.00	.....	.....
1346A	Corn Chops.....	J. E. Huckabee.....	Guarantee	9.00	3.00	3.00	70.00	.....	.....
583A	Cottonseed Meal.....	Leonard Cotton Oil Co.....	Guarantee	49.00	6.00	6.00	24.00	.....	.....

LEVITA, TEXAS.

774A	Wheat Bran.....	Levita Roller Mill.....	Guarantee	14.50	3.00	10.00	52.00
774B	Corn Chops.....		Guarantee	9.00	3.00	3.50	68.00

LEWISVILLE, TEXAS.

577A	Corn Chops.....	W. D. Keen.....	Guarantee	9.00	3.00	3.00	70.00
577B	Crushed Ear Corn and Shuck.....		Guarantee	7.50	2.50	12.00	62.00
577C	Milo Chops.....		Guarantee	9.50	2.50	3.00	71.00
577D	Wheat Chops.....		Guarantee	12.00	2.00	2.00	71.00
1746A	Cold Pressed Cottonseed.....	Lewisville Cotton Oil Co.....	Guarantee	25.00	6.00	26.00	28.00
134Y	Cold Pressed Cottonseed.....		Found.....	28.02	9.66	19.36	29.31
1746B	Cottonseed Meal.....		Guarantee	44.00	7.50	11.00	24.00
1746B	Cottonseed Meal.....		Found.....	42.76	7.77	13.17	25.53
132Y	Cottonseed Meal.....		Found.....	38.73	8.23	15.45	24.63
1746C	Cottonseed Cake.....		Guarantee	44.00	7.50	11.00	24.00
1746C	Cottonseed Cake.....		Found.....	42.38	6.54	12.97	27.42
133Y	Cottonseed Cake.....		Found.....	41.56	11.12	10.42	23.95
1746D	Cottonseed Meal and Hulls		Guarantee	41.00	7.00	14.00	23.00
1746D	Cottonseed Meal and Hulls		Found.....	41.44	11.22	10.24	24.81
1147A	Corn Chops.....	Lewisville Roller Mills.....	Guarantee	9.00	3.50	3.50	70.00
2154A	Wheat Bran.....	Raiza Milling Co.....	Guarantee	15.00	4.00	10.00	50.00
2154A	Wheat Bran.....		Found.....	18.30	3.85	7.00	53.28
2154B	Milo Chops.....		Guarantee	9.50	3.00	3.00	70.00
2154B	Milo Chops.....		Found.....	10.56	2.64	2.19	71.51
2154C	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00
2154C	Corn Chops.....		Found.....	8.82	3.89	1.79	72.07
154D	Wheat Bran and Milo Meal		Guarantee	12.00	3.00	6.50	61.00
154D	Wheat Bran and Milo Meal		Found.....	13.97	3.28	4.24	64.06
2154E	Wheat Bran Screenings and Kafir Chops.....		Guarantee	11.00	3.00	5.00	63.00
2154E	Wheat Bran Screenings and Kafir Chops.....		Found.....	12.04	3.51	4.55	66.91

Adulterated hulls.
Adulterated hulls.
Adulterated hulls.

LEXINGTON, OKLAHOMA.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Extract.	Ingredients.	Remarks.
1695A	Alfalfa Meal.....	E. M. Abernathy.....	Guarantee	14.00	1.20	33.00	33.00	.....	.....
254A	Corn Chops.....	Lexington Flouring Mills..	Guarantee	9.00	3.50	3.50	70.00	.....	.....
254B	Wheat Bran.....		Guarantee	14.50	3.50	10.00	50.00	.....	.....
254C	Wheat Shorts.....		Guarantee	15.50	3.50	5.00	60.00	.....	.....
254D	Mixed Feed.....		Guarantee	14.50	3.50	10.00	50.00	Wheat and corn screenings	.....

LEXINGTON, MISSOURI.

LIBERAL, KANSAS.

1411A	Wheat Bran.....	Bolin-Hall Milling Co.....	Guarantee	17.94	4.14	6.88	56.25	.....	.....
1411B	Wheat Shorts.....		Guarantee	16.71	3.00	4.81	63.40	.....	.....
1411C	Corn Chops.....		Guarantee	11.18	4.52	2.14	70.86	.....	.....

LIBERTY, TEXAS.

2087A	Corn Chops.....	C. C. Hays.....	Guarantee	9.00	3.50	3.00	70.00	.....	.....
2087A	Corn Chops.....		Found....	9.38	4.48	1.98	71.02	.....	.....
2087B	Milo Chops.....		Guarantee	10.00	2.50	3.00	71.00	.....	.....
2087B	Milo Chops.....		Found....	10.15	2.73	1.84	70.45	.....	.....
2087C	Mixed Chops.....		Guarantee	9.00	3.00	3.00	70.00	Corn and milo chops.	.....
2087C	Mixed Chops.....		Found....	9.63	3.42	2.04	70.92	.....	.....

LIBERTY HILL, TEXAS.

680A	Corn Chops.....	Tucker & Seward.....	Guarantee	9.00	4.00	3.00	70.00
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LINCOLN, NEBRASKA.

1390A	Corn Chops.....	Beatrice Corn Mills.....	Guarantee	9.00	4.00	3.00	70.00
1390H	Corn Germ Meal.....		Guarantee	11.00	8.00	4.00	70.00	.....	.....

1669A	Corn Chops.....	Nebraska Corn Mills.....	Guarantee	9.00	3.50	3.00	65.00	
1669B	Hominy Feed.....		Guarantee	9.00	5.00	5.00	65.00	
LINDSBORG, KANSAS.								
1389A	Wheat Bran.....	Lindsborg Milling and Elevator Co.	Guarantee	14.50	3.50	10.00	50.00	
1389B	Wheat Shorts.....		Guarantee	15.50	4.00	6.00	55.00	
1389D	Wheat Shorts and Screenings.....		Guarantee	16.00	3.50	7.00	55.00	
1389E	Wheat Mixed Feed and Screenings.....		Guarantee	16.00	3.50	8.50	50.00	Wheat bran, shorts and screenings.
LITTLE ROCK, ARKANSAS.								
1433A	Corn Chops.....	Cunningham Commission Co.	Guarantee	9.00	3.50	3.00	69.00	
1433B	Mixed Mill Feed.....		Guarantee	13.50	3.50	11.00	52.00	Wheat and rice bran, wheat shorts and hominy feed.
1433C	Pulaski Horse Feed.....		Guarantee	12.00	3.50	12.00	52.00	Corn, Oats, Alfalfa, wheat and rice bran and oil meal.
1433D	Wheat Shorts.....		Guarantee	15.00	4.00	5.00	56.00	
1433E	Wheat Bran and Screenings.....	Cunningham Commission Co.	Guarantee	14.50	3.00	10.00	54.00	
1433F	Mixed Mill Feed.....		Guarantee	13.50	3.50	11.00	52.00	Wheat bran, shorts, rice bran, rice polish and hominy feed.
1433G	Pulaski Mixed Horse Feed.....		Guarantee	12.00	3.50	12.00	52.00	Corn chops, oats, wheat and rice bran, alfalfa and oil meal.
1433H	Horse Life Feed.....		Guarantee	10.00	2.00	12.00	56.00	Molasses, oats, corn chops, alfalfa meal, rice bran and oil meal.
1433I	Pulaski Molasses Feed.....	T. H. Bunch Commission Co.	Guarantee	10.00	2.00	12.00	56.00	Molasses, oats, corn chops, alfalfa and oil meal.
1433J	Moca Horse Feed.....		Guarantee	10.00	2.00	12.00	56.00	Molasses, oats, corn chops, alfalfa and oil meal and salt.
1433K	Pulaski Mill Feed.....		Guarantee	13.00	4.00	12.00	52.00	Wheat and corn bran, rice bran and polish and wheat shorts
298A	Corn Chops.....		Guarantee	9.00	4.00	3.00	70.00	
298B	Wheat Bran.....	T. H. Bunch Commission Co.	Guarantee	16.94	4.50	8.53	53.45	
298C	Hominy Feed.....		Guarantee	8.20	7.25	8.08	65.75	
298E	Alfalfa Lass.....		Guarantee	10.00	1.00	20.00	48.20	Ground alfalfa hay and molasses.
298F	Quapaw Mixed Feed.....		Guarantee	14.00	6.50	9.40	51.00	Wheat bran, rice polish and rice bran

LITTLE ROCK, ARKANSAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Extr.	Ingredients.	Remarks.
298G	Quapaw Feed.....	T. H. Bunch Commission Co.—Continued.	Guarantee	13.50	9.00	6.00	55.00	Wheat shorts, rice bran and rice polish.	
298H	Quapaw Horse and Mule Feed.		Guarantee	11.00	2.65	11.50	55.10	Ground alfalfa, molasses, corn and oats.	
1930A	Mixed Feed.....	Hayes Grain and Commission Co.	Guarantee	13.00	6.00	9.50	51.00	Rice bran, rice polish and wheat bran	
1930B	King Corn Feed.....		Guarantee	9.00	1.50	18.00	50.00	Ground alfalfa, molasses, corn and oats.	
1930C	Arab Horse Feed.....		Guarantee	8.00	2.00	15.00	58.00	Ground alfalfa, corn, molasses and oats.	
430E	Wheat Bran.....		Guarantee	14.00	3.50	9.50	54.00		
430F	Wheat Shorts.....	H. K. Cochran.....	Guarantee	15.00	4.50	5.00	55.00		
930G	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00		
930I	Wheat Mixed Feed.....		Guarantee	15.00	4.00	8.00	57.00		
460A	Corn Chops.....	Darragh Warehouse Co....	Guarantee	9.00	3.50	3.00	70.00		
460B	Satisfaction Mixed Feed.....		Guarantee	13.30	8.50	8.50	53.30	Wheat bran, rice bran and rice polish	
201A	Corn Chops.....	Munn Corn Product Co....	Guarantee	9.00	4.00	3.00	70.00		
201B	Wheat Bran and Shorts.....		Guarantee	14.50	3.50	10.00	50.00		
424A	Wheat Bran.....	Munn Corn Product Co....	Guarantee	14.50	4.00	9.50	53.50		
424B	Corn Chops.....		Guarantee	9.00	3.50	2.20	70.00		
424C	Wheat Shorts.....		Guarantee	14.75	4.25	5.00	58.00		
424D	Hominy Feed.....		Guarantee	9.00	8.00	8.50	58.00		

LITTLE ELM, TEXAS.

565A	Corn Chops.....	J. W. Nelson & Co.	Guarantee	9.00	4.00	3.00	70.00		
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LITTLE ROBE, OKLAHOMA.

1339A	Corn Chops.....	W. F. Burnett.....	Guarantee	9.00	3.00	3.50	70.00
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LIVINGSTON, TEXAS.

1039A	Corn Chops.....	{ Livingston Manufacturing Co.	Guarantee	9.50	4.07	2.51	71.12
1039B	Ear Corn Chops.....		Guarantee	8.00	3.00	12.00	65.00

LLANO, TEXAS.

590A	Corn Chops.....	F. A. Kothmann.....	Guarantee	9.00	4.00	3.00	70.00
660A	Cottonseed Meal.....	{ Llano Cottonseed Oil Mill Association.	Guarantee	44.00	7.00	9.00	25.00
660B	Cottonseed Cake.....		Guarantee	44.00	7.00	9.00	25.00
660C	Cold Pressed Cottonseed ...		Guarantee	29.00	6.30	25.00	28.00
93A	Corn Chops.....	Llano County Farmers' Union Warehouse Co.	Guarantee	9.00	3.50	3.50	70.00

LOCKHART, TEXAS.

821A	Cottonseed Meal.....	{ Lockhart Oil and Gin Co..	Guarantee	44.00	7.00	8.00	22.00
26T	Cottonseed Meal.....		Found.....	46.63	7.72	8.46	24.04
535A	Cottonseed Meal.....	Lockhart Oil and Refining Co.	Guarantee	44.00	8.00	7.00	24.00
589A	Corn Chops.....	Rylander & Cheatham.....	Guarantee	9.00	4.00	3.00	70.00

LOCKNEY, TEXAS.

2084A	Kafir Head Chops.....	{ J. H. Gruver.....	Guarantee	9.50	2.50	8.00	65.00
2084A	Kafir Head Chops.....		Found.....	8.99	2.48	6.30	69.31
2084B	Milo Head Chops.....		Guarantee	9.75	2.40	7.50	65.00
2084B	Milo Head Chops.....		Found.....	8.47	2.48	6.36	68.99
147Y	Milo Head Chops.....		Found.....	8.96	2.35	6.54	68.46
2084C	Feterita Head Chops.....		Guarantee	10.00	2.50	8.50	64.00
2084C	Feterita Head Chops.....		Found.....	10.63	2.49	8.73	66.27
146Y	Feterita Head Chops.....		Found.....	9.33	2.74	9.12	66.36

LOCKNEY, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen.	Ingredients.	Remarks.
2084D	Milo Chops.....	J. H. Gruver—Continued	Guarantee	10.00	2.75	3.00	69.00		
2084D	Milo Chops.....		Found....	10.38	2.76	2.59	71.42		
2084E	Corn Chops.....		Guarantee	9.50	3.50	3.00	70.00		
2084E	Corn Chops.....		Found....	10.44	3.70	2.48	71.03		
1781A	Corn Chops.....	Lockney Coal and Grain Co.	Guarantee	9.00	3.50	3.00	70.00		
1781B	Kafir Chops.....		Guarantee	9.00	2.50	3.00	71.00		
1781C	Milo Chops.....		Guarantee	9.00	2.90	3.00	74.00		
1781D	Wheat Chops.....		Guarantee	12.00	2.00	2.00	71.00		

LOCKPORT, ILLINOIS.

1767A	Famous Feed.....	Northern Illinois Cereal Co.	Guarantee	9.00	3.00	12.00	60.00	Corn, oat hulls and oat middings...	
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LOMETA, TEXAS.

2153A	Ear Corn Chops.....	J. A. Fulton.....	Guarantee	8.50	3.50	8.00	70.00		
2153A	Ear Corn Chops.....		Found....	8.75	4.00	7.10	68.34		

LONE OAK, TEXAS.

2119A	Corn Chops.....	J. N. Dodd.....	Guarantee	9.50	3.50	3.00	70.00		
2119A	Corn Chops.....		Found....	10.81	4.28	2.62	68.11		Adulterated wheat screenings.
967A	Corn Chops.....	Farmers Gin Co.....	Guarantee	9.00	4.00	3.00	70.00		
492A	Cottonseed Meal.....	Lone Oak Oil and Gin Co.	Guarantee	47.00	6.00	9.00	20.00		
126Y	Cottonseed Meal.....		Found....	45.56	7.16	7.83	24.15		
492B	Corn Chops.....		Guarantee	9.00	4.00	3.00	70.00		
492C	Jersey Cream Mixed Feed		Guarantee	9.25	2.50	45.00	32.00	Cottonseed hulls and meal.	
492D	Lone Oak Mixed Feed...		Guarantee	12.00	3.00	35.00	30.00	Cottonseed hulls and meal.	

492E	Cottonseed Meal and Hulls	Guarantee	43.00	6.00	12.00	21.00
492F	Cottonseed Cake and Hulls	Guarantee	43.00	6.00	12.00	21.00
1448A	Corn Chops.....	Guarantee	9.00	4.00	3.00	68.00

Union Supply House.

LONGMONT, COLORADO.

1060A	Wheat Bran.....	Guarantee	15.11	3.27	10.00	52.60
1175A	Wheat Bran and Shorts.....	Guarantee	15.00	4.00	9.00	55.00

Longmont Farmers' Milling
and Elevator Co.

Longmont Flour Milling Co.

LONGVIEW, TEXAS.

1836A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00
1836B	Thoroughbred Wheat Bran.....	Guarantee	14.50	3.50	10.00	52.00
1836C	Thoroughbred Milo Chops.....	Guarantee	9.50	2.50	3.00	71.00
1836D	Thoroughbred Mixed Chops.....	Guarantee	9.00	3.00	3.00	70.25
1836E	Thoroughbred Chicken Feed with Oyster Shell.....	Guarantee	9.00	1.50	3.00	65.00
604A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	24.00
62R	Cottonseed Meal.....	Found....	42.75	6.87	10.65	27.12
604B	Mixed Feed.....	Guarantee	11.00	1.75	42.50	27.00
993B	Model Dairy Mixed Feed...	Guarantee	18.00	4.00	5.00	55.00
993B	Model Dairy Mixed Feed...	Found....	21.52	4.40	6.59	53.87

East Texas Mill and Ele-
vator Co.

Longview Cotton Oil Co....

H. H. Watson.....

Adulterated hulls.

LOS ANGELES, CALIFORNIA.

1966A	Larrowe's Dried Beet Pulp	Guarantee	7.00	.50	22.00	58.00
127	Larrowe's Dried Beet Pulp	Found....	9.44	.76	19.60	58.82

Larrowe Milling Co.....

LOTT, TEXAS.

113A	Corn Chops.....	Guarantee	9.00	3.00	3.00	68.00
113B	Corn and Kafir Chops.....	Guarantee	9.00	2.50	2.50	68.00
113C	Kafir Chops.....	Guarantee	9.00	2.50	2.50	68.00

McAteer Grain Co.....

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen- Extract.	Ingredients.	Remarks.
919A 919B	Corn Chops..... Milo Chops.....	R. B. Red.....	Guarantee Guarantee	9.00 9.50	3.90 2.50	3.00 3.00	70.00 71.00	..........	..........
LOVELAND, COLORADO.									
1089A	Wheat Bran.....	Loveland Milling and Ele- vator Co.	Guarantee	15.00	4.00	8.50	57.50	.....	.....
LUBBOCK, TEXAS.									
818A 818B 818C	Corn Chops..... Kafir Head Chops..... Milo Head Chops.....	Davidson Feed Store.....	Guarantee Guarantee Guarantee	9.00 9.00 8.00	3.00 2.50 2.50	3.00 5.00 7.50	70.00 70.00 60.00	...............	...............
1932A 1932B 1932C 1932D 1932E 1932F 1932G	Corn Chops..... Milo Chops..... Milo Head Chops..... Kafir Chops..... Kafir Head Chops..... Feterita Head Chops..... Feterita Chops.....	Graves & McWhorter.....	Guarantee Guarantee Guarantee Guarantee Guarantee Guarantee Guarantee	9.00 10.00 9.50 10.25 9.25 10.00 11.50	3.50 2.50 2.25 2.75 2.50 7.00 2.50	3.00 3.00 7.50 2.75 7.25 7.00 3.00	70.00 70.50 65.00 68.75 65.50 62.00 68.00	...................................	...................................
2178A 2178B 2178B 2178C 2178C 2178D 2178D	Corn Chops..... Corn Chops..... Kafir Chops..... Kafir Chops..... Milo Chops..... Milo Chops..... Milo Head Chops.....	Hill Milling, Feed and Fuel Co.	Guarantee Found.... Guarantee Found.... Guarantee Found.... Found....	9.50 9.81 10.50 11.25 10.00 9.37 8.50	3.50 4.72 2.75 3.28 2.50 2.78 2.50	3.00 2.32 3.00 2.55 3.00 2.54 7.50	70.00 73.77 69.50 71.81 71.00 73.27 60.00	...................................	...................................

2178E	Wheat Mixed Feed.....	Guarantee	16.00	4.00	6.00	55.00	Wheat bran and shorts.....
2178E	Wheat Mixed Feed.....	Found....	18.96	4.06	7.06	54.52	
2185A	Corn Chops.....	Guarantee	9.50	3.50	3.00	70.00	
2185A	Corn Chops.....	Found....	9.36	4.27	2.48	73.66	
2185B	Milo Chops.....	Guarantee	10.00	2.50	3.00	71.00	
2185B	Milo Chops.....	Found....	8.59	2.83	2.92	73.10	
2185C	Milo Head Chops.....	Guarantee	9.75	2.40	7.50	65.00	
2185C	Milo Head Chops.....	Found....	7.85	2.29	7.47	70.23	
1491A	Milo Head Chops.....	Guarantee	8.00	2.50	8.00	70.00	
1491B	Milo Chops.....	Guarantee	10.00	2.50	3.00	71.00	
1491B	Milo Chops.....	Found....	10.38	2.51	2.34	71.87	
1491C	Corn Chops.....	Guarantee	9.50	3.50	3.00	70.00	
1491C	Corn Chops.....	Found....	10.06	4.38	2.10	71.66	

LUCAS, TEXAS.

1335A	Corn Chops.....	Guarantee	9.00	3.00	3.50	70.00	
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LULING, TEXAS.

1439A	Corn Chops.....	Guarantee	9.00	3.00	3.50	70.00	
465A	Cottonseed Meal.....	Guarantee	44.00	7.00	8.00	22.00	
41T	Cottonseed Meal.....	Found....	45.25	7.49	10.20	24.51	
465B	Cottonseed Meal and Hulls	Guarantee	43.00	7.00	12.00	23.00	
465B	Cottonseed Meal and Hulls	Found....	42.19	7.48	11.75	26.99	
59A	Corn Chops.....	Guarantee	9.60	3.90	2.52	71.71	
59B	Crushed Corn and Cob Chops.	Guarantee	7.00	2.75	11.00	68.00	
59C	Corn Bran.....	Guarantee	8.95	6.24	10.79	62.35	
59D	Ear Corn Chops.....	Guarantee	8.00	2.50	12.00	60.00	
59E	Corn Chops and Corn Bran	Guarantee	10.07	3.77	2.63	72.00	
59F	Milo Chops.....	Guarantee	10.00	2.50	3.00	70.50	

LYONS, KANSAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen.	Ex- tract.	Ingredients.	Remarks.
71A	Wheat Bran.....	Lyons Milling Co.....	Guarantee	14.50	3.50	10.00	51.00	.....	.....	.....
71B	Wheat Mixed Feed.....		Guarantee	14.50	3.50	8.00	51.00	Wheat bran and shorts.....	.....	.....
71C	Wheat Shorts.....		Guarantee	14.50	3.50	5.00	60.00	.....	.....	.....
71D	Corn Chops.....		Guarantee	9.00	3.00	3.50	70.00	.....	.....	.....

LYON, TEXAS.

674A	Cottonseed Meal and Hulls	Lyon Oil Mill Co.....	Guarantee	43.00	6.00	10.00	21.00	.....	.....	.....
674B	Cottonseed Meal.....		Guarantee	44.00	7.00	11.00	22.00	.....	.....	.....

MACALLEN, TEXAS.

1905A	Corn Chops.....	Osborne & Jones.....	Guarantee	9.80	3.90	2.46	71.57
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MCGREGOR, TEXAS.

10A	Corn Chops.....	McGregor Milling and Grain Co.	Guarantee	9.00	4.00	3.00	70.00
10G	Mixed Chops.....		Guarantee	9.50	2.60	3.00	71.00	Milo and kafir chops.....	.....	.....
440A	Cottonseed Meal.....	McGregor Oil and Manufacturing Co.	Guarantee	44.00	7.00	11.00	24.00	.....	.....	.....
34B	Cottonseed Meal.....		Found.....	44.07	7.60	10.95	24.23	.....	.....	.....
440B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	24.00	.....	.....	.....
440C	Cottonseed Meal and Hulls		Guarantee	43.00	7.00	12.00	23.00	.....	.....	.....
440C	Cottonseed Meal and Hulls		Found.....	43.35	7.04	11.34	23.88	.....	.....	.....
378A	Wheat Bran.....	Farmers' Mill.....	Guarantee	17.00	3.31	6.80	60.13	.....	.....	.....
378B	Corn Chops.....		Guarantee	9.00	4.00	3.00	70.00	.....	.....	.....
378C	Mixed Chops.....		Guarantee	9.25	3.00	3.00	70.50	Milo and corn chops.....	.....	.....
378D	Mixed Feed.....		Guarantee	12.00	3.00	8.00	60.00	Wheat bran, corn bran and screenings.....	.....	.....

McKINNEY, TEXAS.

1194A	Corn Chops.....	Browne Grain Co.....	Guarantee	9.00	3.50	3.50	70.00	.....
31A	Wheat Bran.....	Collin County Mill and Elevator Co.	Guarantee	14.50	3.50	10.00	50.00	.....
31B	Wheat Shorts.....		Guarantee	15.00	3.50	5.00	60.00	.....
31C	Corn Chops.....		Guarantee	9.00	4.00	3.00	70.00	.....
31D	Corn Bran.....		Guarantee	9.00	4.00	10.00	50.00	.....
31E	Wheat Bran and Screenings		Guarantee	14.50	3.50	10.00	50.00	.....
31F	Corn Chops and Corn Bran		Guarantee	9.00	4.00	3.00	70.00	.....
31G	Wheat Bran, Corn Bran and Screenings.		Guarantee	14.50	3.50	10.00	50.00	.....
31H	Milo Chops.....		Guarantee	9.50	2.75	2.00	68.50	.....
31H	Milo Chops.....		Found.....	11.00	2.57	1.92	73.23	.....
31I	Collinco Mixed Feed.....		Guarantee	10.00	2.50	5.00	65.60	Milo and kafir chops and wheat bran
31I	Collinco Mixed Feed.....		Found.....	13.11	3.26	4.20	65.75	.....
47A	Corn Chops.....	Hill & Webb.....	Guarantee	9.00	3.50	3.00	70.00	.....
47B	Corn Bran.....		Guarantee	9.00	4.00	10.00	50.00	.....
47C	Hen Food Egg Producer with Grit.		Guarantee	11.00	2.75	4.25	42.00	Milo, corn chops, wheat, oats and grit.
809A	Cottonseed Meal.....	McKinney Cotton Oil Mill Co.	Guarantee	44.00	7.00	11.00	24.00	.....
83Y	Cottonseed Meal.....		Found.....	45.15	7.22	9.76	24.55	.....
809B	Primo.....		Guarantee	11.50	3.50	45.00	20.00	Cottonseed hulls and meal.
82Y	Primo.....		Found.....	12.63	2.24	39.67	32.40	.....
809C	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	24.00	.....

McLEAN, TEXAS.

2182A	Kafir Chops.....	Newton & Harris.....	Guarantee	10.50	2.75	3.00	69.50	.....
2182A	Kafir Chops.....		Found.....	9.69	2.83	1.95	72.17	.....
2182B	Corn Chops.....		Guarantee	9.50	3.50	3.00	70.00	.....
2182B	Corn Chops.....		Found.....	9.15	4.87	2.19	70.96	.....
2182C	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.00	.....
2182C	Milo Chops.....		Found.....	11.44	2.92	2.14	71.03	.....

MCPHERSON, KANSAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen Free Extract.	Ingredients.	Remarks.
998A	Wheat Bran.....	Wall-Rogalsky Milling Co.	Guarantee	14.00	3.50	9.50	54.00	.....
998B	Wheat Shorts.....		Guarantee	16.00	4.00	6.00	60.00	.....
998D	Wheat Mixed Feed and Screenings.		Guarantee	15.50	3.50	8.50	55.00	Wheat bran, shorts and screenings..	
998E	Wheat Bran and Screenings		Guarantee	15.00	3.50	10.00	55.00	.....
998F	Wheat Shorts and Screenings		Guarantee	16.00	3.50	4.50	60.00	.....

MADILL, OKLAHOMA.

685A	Corn Chops.....	Madill Grain and Elevator Co.	Guarantee	9.00	4.00	3.00	70.00	.....
934A	Corn Chops.....	Marsh Milling and Grain Co.	Guarantee	9.00	4.00	3.50	70.00	.....

MADISONVILLE, TEXAS.

1772A	Cottonseed Meal.....	Madisonville Oil Mill and Fertilizer Co.	Guarantee	44.00	7.00	11.00	19.00	.....
1772B	Choice Cottonseed Meal....		Guarantee	48.00	7.00	9.00	19.00	.....

MANGUM, OKLAHOMA.

1232A	Corn Chops.....	Mangum Mill and Elevator Co.	Guarantee	9.00	3.00	3.50	70.00	.....
1232B	Wheat Bran and Shorts....		Guarantee	15.50	3.50	9.00	55.00	.....

MANHATTEN, KANSAS.

1330A	Corn Chops.....	Purity Milling Co.....	Guarantee	8.82	4.24	3.00	67.50	.....
1330B	Alfalfa Molasses Feed.....		Guarantee	11.93	.45	22.46	42.50	Ground alfalfa and molasses.....	
1330C	Sunflower Alfalfa Meal.....		Guarantee	13.00	1.33	53.00	56.00	.....

666A	Cold Pressed Cottonseed....	Mansfield Cotton Oil Co..	{ Guarantee	28.00	6.50	26.00	30.00
666C	Ground Cold Pressed Cottonseed.		{ Guarantee	28.00	6.50	26.00	30.00

MARBLE FALLS, TEXAS.

275A	Corn Chops.....	Cox & Son.....	{ Guarantee	9.00	4.00	3.00	70.00
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MARLIN, TEXAS.

1046A	Corn Chops.....	A. C. Bradshaw.....	{ Guarantee	9.00	3.50	3.00	70.00
514A	Cottonseed Meal.....		{ Guarantee	44.00	7.00	11.00	24.00
50B	Cottonseed Meal.....		{ Found....	45.76	7.62	7.84	25.89
16R	Cottonseed Meal.....	Marlin Oil Co.....	{ Found....	44.73	7.55	9.51	26.12
514B	Cottonseed Cake.....		{ Guarantee	44.00	7.00	11.00	24.00
17R	Cottonseed Cake.....		{ Found....	47.47	7.11	7.82	25.30
434A	Corn Chops.....	Nash-Robinson & Co.....	{ Guarantee	9.00	3.50	3.00	65.00
1917A	Corn Chops.....	E. E. Pitman.....	{ Guarantee	9.00	3.50	3.00	70.00
2028A	Hominy Feed.....	Scheef Bros. Grain Co.....	{ Guarantee	9.00	6.00	5.60	60.00
2028A	Hominy Feed.....		{ Found....	10.69	3.48	2.37	70.47

MARLOW, OKLAHOMA.

663A	Corn Chops.....	W. B. Terry.....	{ Guarantee	9.00	4.00	3.00	70.00
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MARSHALL, MISSOURI.

1383A	Winter Wheat Bran.....		{ Guarantee	15.00	3.50	10.00	50.00
1383B	Winter Wheat Shorts.....	Mose H. Land Milling Co.	{ Guarantee	16.00	4.00	7.00	55.00
1383C	Corn Chops.....		{ Guarantee	9.00	3.00	3.50	70.00
1021A	Wheat Bran.....	Rea and Page Milling Co.	{ Guarantee	16.00	4.00	10.00	49.00
1021B	Wheat Bran and Shorts.....		{ Guarantee	16.00	3.50	9.00	55.00

TEXAS AGRICULTURAL EXPERIMENT STATION.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Ex- tract.	Ingredients.	Remarks.
1021C	Wheat Shorts.	Rea & Page Milling Co.— Continued.	Guarantee	15.50	3.50	5.00	60.00		
1021D	Corn Chops.		Guarantee	9.00	3.00	3.50	70.00		
1021E	Wheat Bran and Screenings		Guarantee	12.00	2.00	12.00	60.00		
1021F	Mixed Feed.		Guarantee	14.00	3.10	10.00	59.00	Wheat bran, shorts and screenings.	
MARSHALL, OKLAHOMA.									
118A	Corn Chops.	Marshall Cereal Co.	Guarantee	9.00	4.00	3.00	70.00		
MARSHALL, TEXAS.									
1720A	Cottonseed Meal.	Marshall Cotton Oil Co.	Guarantee	44.00	7.00	11.00	24.00		
45Y	Cottonseed Meal.		Found	45.25	7.11	8.27	26.36		
1720B	Cottonseed Cake.		Guarantee	44.00	7.00	11.00	24.00		
1720C	Cottonseed Meal and Hulls		Guarantee	41.00	6.50	12.50	23.00		
1720D	Whole Pressed Peanut Meal		Guarantee	36.00	6.00	22.00	23.00		
1720D	Whole Pressed Peanut Meal		Found	34.73	8.65	24.67	20.88		
1720E	Whole Pressed Peanut Cake		Guarantee	36.00	6.00	22.00	23.00		
1720E	Whole Pressed Peanut Cake		Found	34.48	7.45	24.49	20.99		
1720F	Cottonseed Meal and Hulls		Guarantee	39.00	6.50	14.00	23.00		
250A	Corn Chops.		Guarantee	9.00	3.50	3.00	70.00		
130Y	Corn Chops.		Found	10.00	4.49	2.57	68.97		
64R	Corn Chops.		Found	10.19	4.51	2.55	68.41		
66R	Corn Chops.		Found	10.02	4.03	2.49	69.60		Adul. Kafir and sweepings.
66R	Corn Chops.	Marshall Mill and Elevator Co.	Found	10.00	3.70	2.13	70.21		Adul. Kafir and sweepings.
250B	Corn Chops and Corn Bran		Guarantee	9.00	3.50	3.25	70.00		Adulterated Kafir.
250C	Kafir Chops.		Guarantee	9.00	3.75	3.00	65.00		
250D	Milo Chops.		Guarantee	10.00	2.50	3.00	70.50		

	Guarantee	9.00	5.00	10.50	63.00
250E Corn Bran.....	Guarantee	9.00	2.00	18.00	45.00
250F Mixed Feed.....	Found....	12.75	3.05	16.92	46.91
250F Mixed Feed.....	Found....	10.63	1.86	22.73	41.05
67R Mixed Feed.....	Guarantee	9.00	2.00	22.50	45.50
250G Mixed Feed.....	Found....	9.19	1.93	24.51	38.95
250G Mixed Feed.....	Found....	9.19	1.93	24.51	38.95

MARTHA, OKLAHOMA.

1556A	Alfalfa Meal.....	Martha Alfalfa Milling Co....	Guarantee	12.50'	1.75	32.00	37.00
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MART, TEXAS.

	Cottonseed Meal.			Mart Cotton Oil Co.			Adulterated bulls.		
574A	Cottonseed Meal.	Guarantee	44.60	6.40	11.00	24.00			
49B	Cottonseed Meal.	Found...	39.88	6.28	13.26	28.60			
574B	Cottonseed Cake.	Guarantee	44.60	6.40	11.00	24.00			
574C	Cottonseed Meal and Hulls	Guarantee	41.00	6.00	12.00	24.00			
574C	Cottonseed Meal and Hulls	Found...	43.32	5.98	11.69	25.83			
574D	Cottonseed Cake and Hulls	Guarantee	41.00	6.00	12.00	24.00			
574D	Cottonseed Cake and Hulls	Found...	42.42	4.84	12.06	26.26			

MARTINDALE, TEXAS.

616A	Corn Chops.....	A. H. Smith.....	Guarantee	9.00	4.00	3.00	70.00
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MARYNEAL, TEXAS.

1196A	Milo Chops.....	Halsell Arledge Cattle Co....	Guarantee	9.00	2.50	3.00	70.00
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MASON, TEXAS.

1159A	Corn Chops.....	Guarantee	10.12	3.84	2.23	69.42
1159B	Wheat Chops.....	Guarantee	19.00	2.00	4.00	60.00
	Mason Ice and Power Co..					

MAY, TEXAS.

4480A	Corn Chops.....	J. N. Spence.....	Guarantee	9.00	3.50	3.00	71.00
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No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Free Extract.	Ingredients.	Remarks.
546A	Cottonseed Meal.	Humphreys-Godwin & Co.	Guarantee	44.00	7.00	11.00	22.00	.....
546B	Cottonseed Cake.		Guarantee	44.00	7.00	11.00	22.00	.....
1377A	International Cow Feed....		Guarantee	16.50	3.50	12.00	52.50	Cottonseed meal, molasses, corn, alfalfa, clipped oat by-product and salt.	
1377B	International Horse and Mule Feed.	Humphreys-Godwin & Co.	Guarantee	12.50	3.50	12.00	50.00	Cottonseed meal, molasses, corn, alfalfa, clipped oat by-product and salt.	
1377C	International Poultry Feed.		Guarantee	10.00	3.50	5.00	70.00	Wheat, oats, barley, corn, kafir, sunflower seed and milo.	
1377D	International Dry Horse and Mule Feed.		Guarantee	10.00	3.00	15.00	58.00	Corn, oats, alfalfa meal, clipped oat by-product and salt.	
1377E	International Dan Patch Special Horse Feed.	Humphreys-Godwin & Co.	Guarantee	9.00	2.25	12.50	52.50	Corn, oats, alfalfa meal, molasses and salt.	
1377F	International Jewel Feed....		Guarantee	9.00	2.00	12.50	65.00	Alfalfa, corn, clipped oat by-product, molasses and salt.	
135Y	International Jewel Feed....		Found.....	10.97	1.56	19.16	46.82	.....
1377G	International Jewel Hen Feed.	Humphreys-Godwin & Co.	Guarantee	10.00	3.00	5.00	65.00	Cracked corn, wheat, barley, oats, kafir, sunflower seed and miscellaneous seeds.	
1377H	International Tip Top Feed		Guarantee	10.00	3.00	12.50	49.00	Corn, oats, Alfalfa meal, molasses and salt.	
1377I	I. S. F. Special Feed.....		Guarantee	10.00	3.00	12.50	49.00	Corn, oats, alfalfa meal, molasses and salt.	
1377J	International Happy Jack Feed.	International Sugar Food No. 2 Co.	Guarantee	10.00	3.50	17.50	55.00	Corn, oats, alfalfa, oat feed, cottonseed meal and salt.	
1377K	International Jewel Chick Feed.		Guarantee	10.00	3.00	5.00	60.00	Corn, wheat, oats, kafir, milo chopped	
1377L	International Arrow Horse Feed.		Guarantee	9.00	1.75	15.00	50.00	Corn, oats, alfalfa, molasses and salt	

1377M	Everybody's Horse and Mule Feed.	Guarantee	12.50	3.50	12.00	50.00	Cottonseed and alfalfa meal, molasses, corn, clipped oat by-product and salt.
1377N	International Ringleader Horse and Mule Feed.	Guarantee	9.00	1.75	16.00	34.00	Clipped oat by-product, corn, alfalfa, molasses and salt.
1377O	International Poultry Feed Chick Size.	Guarantee	10.00	3.50	5.00	65.00	Cracked wheat and corn, oats, barley, kafir, sunflower seed and millet.
1377P	International Mixit Feed....	Guarantee	9.00	1.00	20.00	69.00	Alfalfa meal and molasses.
1377Q	International Hog Feed and Charcoal.	Guarantee	22.50	5.00	12.00	41.50	Cold process oil meal, tankage, molasses, grain middlings, charcoal and salt.
1377R	International Banquet Hen Feed.	Guarantee	10.00	3.50	5.00	70.00	Wheat, oats, barley, milo, cracked corn and sunflower seed.
1377R	International Banquet Hen Feed.	Found....	11.44	3.01	3.15	70.17	.....
1377S	International Safety Chick Feed.	Guarantee	10.00	3.50	5.00	70.00	Wheat, oats, corn, milo, millet ground.
1377S	International Safety Chick Feed.	Found....	10.94	3.97	3.35	70.68	.....
1664A	Mixed Feed.....	Guarantee	20.00	3.00	23.00	38.00	Cottonseed meal and hull bean....
1299A	Sugarcane.....	Guarantee	11.65	3.00	11.04	55.00	Oats, cottonseed meal, hay, corn, alfalfa and molasses.
1299B	Alfalfation.....	Guarantee	10.00	3.00	11.40	50.00	Alfalfa, molasses and hay.....
1299C	Katleat Mixed Dairy Feed.	Guarantee	17.00	2.50	12.00	47.00	Alfalfa and cottonseed meal, corn and molasses.
1299D	Lass Korn.....	Guarantee	10.00	2.50	12.00	50.00	Corn, cottonseed meal, rice straw, wheat bran, alfalfa and molasses.
1299E	Bossy Dairy Feed.....	Guarantee	9.50	2.00	19.00	45.00	Corn, wheat bran, cottonseed meal, rice straw and molasses.
1299F	Egmo Hen Feed.....	Guarantee	10.00	2.50	3.00	65.00	Wheat, rye, corn and oats.....
1299G	Palmetto Scratch Feed.....	Guarantee	10.00	3.50	4.00	62.00	Corn chop, kafir and wheat.....
1299H	Molha Mixed Feed.....	Guarantee	3.50	1.00	19.00	65.00	Molasses and rice straw.....
1299I	Dixeration Mixed Feed.....	Guarantee	11.50	2.00	17.00	60.00	Ground rice straw, cottonseed meal and molasses.

Memphis Cotton Hull and Fiber Co.

G. E. Patterson & Co.....

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen Extract.	Ingredients.	Remarks.
2167A	Sooco Mixed Feed.....	Southern Cotton Oil Co....	Guarantee	20.00	3.00	23.00	40.00	Cottonseed hulls and meal.....	
2167A	Sooco Mixed Feed.....		Found.....	19.90	3.02	28.19	36.98		
2174A	Creamo Brand Mixed Feed..	Tennessee Fibre Co.....	Guarantee	20.00	4.00	25.00	35.00	Choice cottonseed meal and hull bran	
2174A	Creamo Bran Mixed Feed..		Found.....	23.25	4.05	24.92	34.60		
1623A	Purity Feed.....	John Wade & Sons.....	Guarantee	9.25	4.25	5.50	65.00	Corn chops, corn bran, oats, cottonseed meal and salt.	
1623B	Dairy Feed.....		Guarantee	12.00	2.25	17.50	50.00		
1623C	Syr Ration Horse Feed.....		Guarantee	10.50	2.00	14.00	55.00		
								Corn chops, oats, corn bran, alfalfa and cottonseed meal and molasses.	

MEMPHIS, TEXAS.

474A	Corn Chops.....	Dickson & Orr.....	Guarantee	9.00	4.00	3.00	70.00		
474B	Kafir Chops.....		Guarantee	8.88	2.64	5.27	67.91		
680A	Cottonseed Meal.....		Guarantee	44.00	7.00	11.00	23.00		Adulterated hulls.
25P	Cottonseed Meal.....		Found.....	42.97	11.26	10.27	24.47		
35P	Cottonseed Meal.....		Found.....	39.50	9.44	14.27	24.49		
42P	Cottonseed Meal.....		Found.....	41.50	9.97	10.99	25.78		
94P	Cottonseed Meal.....		Found.....	41.50	10.39	11.83	23.81		
680B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	27.00		
26P	Cottonseed Cake.....		Found.....	42.25	7.62	11.27	26.66		
27P	Cottonseed Cake.....		Found.....	40.17	5.34	14.71	27.19		
33P	Cottonseed Cake.....	Memphis Cotton Oil Co....	Found.....	40.39	7.01	14.40	25.90		Adulterated hulls.
34P	Cottonseed Cake.....		Found.....	40.10	5.77	14.33	27.75		
36P	Cottonseed Cake.....		Found.....	41.88	6.35	13.54	25.90		
37P	Cottonseed Cake.....		Found.....	40.26	6.44	14.22	26.66		

Adulterated hulls.

39P	Cottonseed Cake.	Found....	43.44	6.49	11.31	24.95	
680C	Dixie Cream Mixed Feed...	Guarantee	10.00	3.00	40.00	35.00	Cottonseed hulls and meal.
680D	Screened Cottonseed Cake...	Guarantee	44.00	7.00	8.09	24.44	
680E	Cottonseed Meal and Hulls	Found....	40.00	5.00	15.00	27.00	
680F	Cottonseed Meal and Hulls	Found....	33.82	9.31	13.40	26.19	
680G	Cottonseed Cake and Hulls	Found....	35.94	5.84	16.11	29.75	
680F	Cottonseed Cake and Hulls	Guarantee	40.00	5.00	15.00	27.00	
680F	Cottonseed Cake and Hulls	Found....	33.41	6.40	13.09	26.95	
381A	Corn Chops.	Guarantee	9.00	4.00	3.00	70.00	
381B	Milo Chops.	Guarantee	9.00	2.50	3.50	70.00	
681C	Kafir Chops.	Guarantee	9.50	2.75	3.00	70.00	

Memphis Milling Co.

MENARD, TEXAS.

2149A	Corn Chops.	Guarantee	9.50	3.50	3.00	70.00	
2149A	Corn Chops.	Found....	10.31	4.40	2.42	71.75	

H. P. Roddie Commission Co.

MERCEDES, TEXAS.

1771A	Corn Chops.	Guarantee	9.00	3.50	3.00	70.00	
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Rio Grande Grain and Milling Co.

MERETA, TEXAS.

819A	Crushed Milo Heads.	Guarantee	8.50	2.50	9.00	65.00	
1865A	Crushed Milo Head Chops.	Guarantee	8.00	2.50	7.50	66.00	

J. A. Loomis.

R. L. Dickey.

MERKEL, TEXAS.

2055A	Milo Chops.	Guarantee	10.00	2.50	3.00	71.00	
2055A	Milo Chops.	Found....	11.97	2.23	2.30	71.45	

C. P. Stevens.

MERIDIAN, TEXAS.

19A	Corn Chops.	Guarantee	9.00	3.50	3.00	70.00	
19B	Wheat Bran.	Guarantee	15.00	3.90	7.40	55.00	
19C	Mixed Bran.	Guarantee	15.00	3.50	9.00	55.00	Wheat and corn bran.

Meridian Mill Co.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen- Free Extract.	Ingredients.	Remarks.
19D	Wheat Shorts.....	Meridian Mill Co.—Cont.	Guarantee	15.50	2.90	4.00	66.00	.....
19E	Barley Chops.....		Guarantee	11.00	1.75	6.50	62.00	.....
19F	Wheat Bran and Screenings		Guarantee	15.00	3.90	7.40	55.00	.....
19G	Mixed Bran and Screenings		Guarantee	15.00	3.50	9.00	55.00	Wheat and corn bran and screenings	
19H	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50	.....
MERTZON, TEXAS.									
1961A	Corn Chops.....	F. L. Caldwell.....	Guarantee	9.00	3.50	3.00	70.00	.....
MESQUITE, TEXAS.									
274A	Corn Chops.....	Mesquite Corn Mill.....	Guarantee	9.00	4.00	3.00	70.00	.....
1936A	Corn Chops.....	Alva Summers.....	Guarantee	9.00	3.50	3.00	70.00	.....
MEXIA, TEXAS.									
1690A	Corn Chops.....	Miller Wills & Cox.....	Guarantee	9.00	4.00	3.00	70.00	.....
40A	Cottonseed Meal.....	Munger Oil and Cotton Co.	Guarantee	44.00	7.00	11.00	24.00	.....
25B	Cottonseed Meal.....		Found.....	47.88	6.54	9.43	22.78	.....
40B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	24.00	.....
358	Corn Chops.....	W. H. Wallace.....	Guarantee	9.00	3.00	3.00	70.00	.....
MIAMI, TEXAS.									
2104A	Corn Chops.....	G. W. Seay.....	Guarantee	9.50	3.50	3.00	70.00	.....
2104A	Corn Chops.....		Found.....	9.63	4.35	2.09	69.06	.....
2104B	Kafir Chops.....		Guarantee	10.50	2.75	3.00	69.50	.....

MICKEY, TEXAS.

2104B	Kafir Chops.....	Found....	12.77	3.12	1.85	69.16
2104C	Milo Chops.....	Guarantee	10.00	2.50	3.00	71.00
2104C	Milo Chops.....	Found....	11.31	2.67	2.05	71.01

588A	Kafir Chops.....	J. T. McLain	8.50	2.20	10.00	55.00
588B	Milo Chops.....	Guarantee	8.00	2.50	3.00	65.00

MIDLAND, TEXAS.

2145A	Corn Chops.....	J. E. Hill	9.50	3.50	3.00	70.00
2145A	Corn Chops.....	Found....	9.10	4.72	2.67	72.02
2145B	Mixed Chops.....	Guarantee	9.50	2.75	3.00	68.00
2145B	Mixed Chops.....	Found....	10.94	2.77	2.60	70.21
1954A	Corn Chops.....	Midland Mercantile Co.	9.00	3.50	3.00	70.00
1927A	Corn Chops.....	Wright & Anthony	9.00	3.50	3.00	70.00
1927B	Milo Head Chops.....	Guarantee	9.50	2.25	7.50	65.00
1927C	Feterita Chops.....	Guarantee	10.25	2.75	2.75	68.25

MIDLOTHIAN, TEXAS.

207A	Corn Chops.....	R. W. Dillard	9.00	3.50	3.00	70.00
207B	Kafir Chops.....	Guarantee	9.00	2.50	3.50	70.00
207C	Wheat Bran.....	Guarantee	14.50	3.00	10.00	50.00
502A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	24.00
566B	Cottonseed Meal.....	Found....	37.88	8.78	13.38	26.82
502B	Corn and Cob Chops.....	Guarantee	8.00	3.00	8.00	65.00
502C	Ear Corn Chops with Shuck.....	Guarantee	8.00	2.50	10.00	65.00
502E	Cottonseed Cake.....	Guarantee	44.00	7.00	11.00	24.00
502F	Cottonseed Meal and Hulls.....	Guarantee	38.00	7.00	14.00	24.00
02E	Cottonseed Meal and Hulls.....	Found....	40.10	6.20	13.86	26.32

Midlothian Oil and Gin Co.

MILES, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Ex- tract.	Ingredients.	Remarks.
2126A	Corn Chops.....	G. J. Moore.....	Guarantee	9.50	3.50	3.00	70.00	.....
2126A	Corn Chops.....		Found....	10.50	4.33	2.35	69.25	.....
2126B	Milo Chops.....		Guarantee	10.00	2.50	3.00	71.00	.....
2126B	Milo Chops.....		Found....	11.38	2.55	2.40	70.89	.....
2126C	Milo Head Chops.....		Guarantee	9.75	2.40	7.50	65.00	.....
2126C	Milo Head Chops.....		Found....	11.06	2.72	7.89	66.80	.....

MILFORD, TEXAS.

2152A	Corn Chops.....	J. E. Parker.....	Guarantee	9.00	3.50	3.00	70.00	.....
2152A	Corn Chops.....		Found....	9.88	4.63	1.99	70.89	.....
1092A	Corn Chops.....	J. E. Davis.....	Guarantee	9.00	3.50	3.00	70.00	.....

MINCO, OKLAHOMA.

1107A	Corn Chops.....	Minco Mill and Grain Co....	Guarantee	9.00	3.50	3.00	70.00	
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MINEOLA, TEXAS.

1751A	Cottonseed Meal.....	Mineola Cotton Oil Co....	Guarantee	44.00	7.00	11.00	22.00	
1751B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	22.00	.....

MINERAL WELLS, TEXAS.

708A	Cold Pressed Cottonseed.....	Mineral Wells Cottonseed Oil Co.	Guarantee	27.00	6.30	25.00	28.00	.....
139A	Corn Chops.....	Mineral Wells Roller Mills Co.	Guarantee	9.00	4.00	3.00	70.00	.....
139B	Wheat Bran.....		Guarantee	14.00	3.50	10.00	50.00	.....
139C	Wheat Mixed Feed.....		Guarantee	16.00	3.60	8.00	55.00	.....
139C	Wheat Mixed Feed.....		Found....	17.77	3.78	6.88	57.67	.....

1443A	Corn Chops.....	E. A. Moffitt.....	{ Guarantee	9.00	3.50	3.00	70.00	.....
1443B	Mixed Feed.....		{ Guarantee	11.00	3.00	4.00	65.00	Wheat bran and shorts and milo chops.
1443C	Milo Chops.....		{ Guarantee	9.00	2.75	3.00	71.00	.....
1443D	Kafir Chops.....		{ Guarantee	9.00	2.50	3.00	71.00	.....

MONETT, MISSOURI.

1375A	Wheat Shorts.....	{ Patterson Milling Co.....	{ Guarantee	14.00	4.00	3.50	63.00	.....
1375B	Wheat Bran.....		{ Guarantee	14.00	3.50	10.00	53.00	.....

MOODY, TEXAS.

941A	Corn Chops.....	{ Moody Grain and Elevator { Co.	{ Guarantee	9.00	3.50	3.00	70.00	.....
941B	Mixed Feed.....		{ Guarantee	16.00	4.00	11.00	50.00	Corn bran and cottonseed meal.....

MORAN, TEXAS.

1637A	Corn Chops.....	{ L. E. Huskey.....	{ Guarantee	9.00	3.50	3.00	70.00
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MORRIS RANCH, TEXAS.

208A	Corn Chops.....	{ Morris Ranch Milling Co....	{ Guarantee	9.00	3.00	3.00	70.00
208B	Wheat Bran and Shorts....		{ Guarantee	14.50	3.50	10.00	50.00	.....
208C	Wheat Chops.....		{ Guarantee	14.00	2.50	5.00	60.00	.....

MORRIS, OKLAHOMA.

304A	Corn Chops.....	{ Stewart & Russell.....	{ Guarantee	9.00	4.00	3.00	70.00
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MOULTON, TEXAS.

425A	Cottonseed Meal.....	{ Moulton Oil and Gin Co.....	{ Guarantee	44.00	7.00	11.00	24.00
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MOUNDRIDGE, KANSAS.

1816A	Wheat Bran and Screenings..	{ Moundridge Milling Co.....	{ Guarantee	14.50	3.00	10.00	50.00
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MOUNTAIN GROVE, MISSOURI.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
1681A	Mixed Bran and Screenings.	Star Milling Co.	Guarantee	15.00	6.00	10.50	53.50	Corn and wheat bran and screenings	
1681B	Wheat Shorts.		Guarantee	15.00	3.00	5.00	60.00		
1681C	Corn Chops.		Guarantee	9.00	4.00	3.00	70.00		
MOUNT BLANCO, TEXAS.									
2139A	Milo Chops.	P. V. Price.	Guarantee	10.00	2.50	3.00	71.00		
2139A	Milo Chops.		Found	11.25	2.41	2.43	72.17		
MOUNT CALM, TEXAS.									
810B	Cottonseed Cake.	Mount Calm Cotton Oil Co.	Guarantee	45.00	6.00	11.00	20.00		
810C	Cottonseed Meal.		Guarantee	45.00	6.00	11.00	20.00		
70B	Cottonseed Meal.		Found	44.50	6.61	10.72	25.05		
MOUNT PLEASANT, TEXAS.									
265A	Cottonseed Meal.	Mount Pleasant Oil Mill.	Guarantee	44.00	7.00	11.00	20.00		
265A	Cottonseed Meal.		Found	45.44	7.52	8.58	26.32		
265B	Cottonseed Meal and Hulls		Guarantee	42.00	7.00	11.00	28.00		
110Y	Cottonseed Meal and Hulls		Found	38.83	7.59	12.86	26.86		Adulterated hulls.
MOUNT VERNON, MISSOURI.									
65A	Cremo Wheat Bran.	Holland-O'Neal Milling Co.	Guarantee	15.00	3.50	10.00	50.00		
65B	Cremo White Wheat Shorts		Guarantee	16.00	4.00	5.00	60.00		
65C	Corn Chops.		Guarantee	9.00	3.50	3.00	70.00		
65D	Cremo Mixed Feed.		Guarantee	15.00	4.00	8.50	55.00	Wheat bran and shorts.	

MOUNT VERNON, TEXAS.

2129A	Milo Chops.....	J. R. Joyce.....	{ Guarantee | 10.00 | 3.50 | 3.00 | 71.00 |
2129A	Milo Chops.....		{ Found..... 9.79 2.67 2.34 70.20

MULDOON, TEXAS.

1662A	Corn Chops.....	Live Oak Farm.....	{ Guarantee 9.00 3.50 3.00 70.00
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MUNDAY, TEXAS.

2047A	Corn Chops.....	Knox County Elevator Co.	{ Guarantee 9.00 3.50 3.00 70.00
2047A	Corn Chops.....		{ Found..... | 10.69 | 3.50 | 2.27 | 70.22 |
2047B	Milo Chops.....		{ Guarantee | 10.00 | 2.50 | 3.00 | 67.00 |
2047B	Milo Chops.....		{ Found..... | 10.94 | 2.53 | 2.73 | 71.93 |
151A	Cottonseed Meal.....	Monday Cotton Oil Co....	{ Guarantee | 44.00 | 7.00 | 11.00 | 24.00 |
14W	Cottonseed Meal.....		{ Found..... | 45.24 | 7.73 | 10.16 | 24.16 |
151B	Cottonseed Cake.....		{ Guarantee | 44.00 | 7.00 | 11.00 | 24.00 |
151C	Cottonseed Meal and Hulls.....		{ Guarantee | 39.00 | 6.00 | 15.00 | 23.00 |
151C	Cottonseed Meal and Hulls.....		{ Found..... | 37.57 | 10.56 | 13.46 | 17.18 |
35W	Cottonseed Meal and Hulls.....		{ Found..... | 37.44 | 10.24 | 13.87 | 26.90 |
1032A	Ear Corn Chops.....	Monday Supply and Feed House.	{ Guarantee | 8.00 | 3.00 | 7.00 | 65.00 |
1032B	Corn Chops.....		{ Guarantee | 9.00 | 3.50 | 3.00 | 70.00 |
943A	Corn Chops.....	F. Templeton.....	{ Guarantee | 9.00 | 4.00 | 3.00 | 70.00 |

MUSKOGEE, OKLAHOMA.

641A	Corn Chops.....	Davidson Mill and Elevator Co.	{ Guarantee | 9.50 | 3.50 | 3.00 | 70.00 |
641B	Wheat Bran.....		{ Guarantee | 14.00 | 4.00 | 9.50 | 53.00 |
641C	Mixed Feed.....		{ Guarantee | 14.00 | 3.00 | 10.00 | 50.00 |
1227A	Corn Chops.....	John T. Hargrove.....	{ Guarantee | 9.00 | 3.00 | 3.50 | 70.00 |

MYRA, TEXAS.

724A	Corn Chops.....	Myra Mill and Elevator Co..	{ Guarantee 9.00 4.00 3.00 70.00
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No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitrogen- Extract.	Ingredients.	Remarks.
564A	Cottonseed Meal.....	Nacogdoches Oil Mill.....	Guarantee	44.00	8.00	7.00	24.00	Adulterated hulls.	
10Y	Cottonseed Meal.....		Found....	42.94	7.41	11.01	24.65		
564B	Cottonseed Cake.....		Guarantee	44.00	8.00	7.00	24.00		
564C	Mixed Feed.....		Guarantee	10.50	2.75	40.00	30.00		Cottonseed hulls and meal.....
564D	Cottonseed Meal and Hulls		Guarantee	43.00	7.00	12.00	23.00		
564D	Cottonseed Meal and Hulls		Found.....	44.39	7.33	10.20	23.18		
NASHVILLE, ILLINOIS.									
1522A	Diploma Wheat Bran.....	Camp Spring Mill Co.....	Guarantee	15.00	3.50	10.00	50.00		
1522B	Diploma Wheat Middling..		Guarantee	16.00	4.50	4.00	57.00		
NAVASOTA, TEXAS.									
862A	Corn Chops.....	Ahrenbeck Mill and Manu- facturing Co.	Guarantee	9.00	4.00	3.00	70.00		
1812A	Corn Chops.....	Ahrenbeck Vehicle Co.....	Guarantee	9.00	3.50	3.00	70.00		
1992A	Corn Chops.....	Barry Grain Co.....	Guarantee	9.00	3.50	3.00	70.00		
772A	Corn Chops.....	J. H. Hutchins.....	Guarantee	9.00	4.00	3.00	70.00		
912A	Corn Chops.....	John T. McGinty.....	Guarantee	9.00	4.00	3.00	70.00		
2025A	Corn Chops.....	McKay & Meyer.....	Guarantee	9.00	3.50	3.00	70.00		
2025A	Corn Chops.....		Found....	9.22	3.06	2.39	72.72		
1562A	Corn Chops.....	O. G. Noack.....	Guarantee	9.00	4.00	3.00	70.00		

1555A	Cold Pressed Cottonseed.....	Planters Cotton Oil Co.....	Guarantee	26.00	7.00	28.00	28.00	.....
803A	Cottonseed Meal.....	Schumacher Oil Works.....	Guarantee	46.00	7.00	8.00	21.00	.....
1027A	Corn Chops.....	C. B. Sledge.....	Guarantee	9.00	3.55	3.00	70.00	.....
480A	Corn Chops.....	O. L. Steele.....	Guarantee	9.00	3.50	3.00	70.00	.....
2196A	Sargo Chops.....	Guy Yarbrough.....	Guarantee	8.00	2.50	3.00	69.00	.....
2196A	Sargo Chops.....		Found....	8.95	3.13	2.88	72.50	.....

NEBRASKA CITY, NEBRASKA.

1413A	Chicken Feed.....	Kingfalfa Mills.....	Guarantee	11.00	3.50	6.00	60.00	Corn, wheat, milo, kafir, barley, speltz and sunflower seed.
1413B	Horse Feed.....		Guarantee	10.75	3.25	12.00	55.00	Corn, oats, syrup and alfalfa.....
1413C	Kingfalfa Dairy Feed.....		Guarantee	13.00	2.35	16.00	50.00	Alfalfa, corn and molasses.....
1413D	Ideal Dry Horse Feed.....		Guarantee	10.25	3.25	12.00	55.00	Corn, oats and alfalfa.....
1413E	Meadow Dairy Feed.....		Guarantee	13.00	2.00	18.00	44.00	Alfalfa meal and molasses.....

NECESSITY, TEXAS.

1777A	Wheat Chops.....	W. A. Andrews & Sons.....	Guarantee	12.00	2.00	2.00	71.00
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NEODESHA, KANSAS.

445A	Corn Chops.....	Land Milling Co.....	Guarantee	9.00	4.00	3.00	70.00
445B	Wheat Bran.....		Guarantee	15.00	3.53	10.00	50.00	.....
445C	Wheat Shorts.....		Guarantee	15.20	3.92	5.00	60.00	.....

NEOSHO, MISSOURI.

569A	Corn Chops.....	Missouri and Kansas Grain Co.	Guarantee	9.00	3.50	3.00	70.00	.....
569B	Wheat Bran.....		Guarantee	14.50	3.50	10.00	54.00	.....
569C	Wheat Shorts.....		Guarantee	15.00	4.00	5.00	58.00	.....
569D	Jingo Mixed Feed.....		Guarantee	9.00	1.50	15.00	55.00	Alfalfa meal, molasses, corn and screenings.
1624A	Neozark Poultry Feed.....	Ozark Feed Co.....	Guarantee	10.00	3.00	3.00	58.00	Corn chops, oats, wheat, kafir and sunflower seed.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen- Free Extract.	Ingredients.	Remarks.
1624B	Neozark Molasses Feed . . .	Ozark Feed Co.—Cont'd..	Guarantee	11.00	3.00	13.00	52.00	Alfalfa meal, molasses, corn chops, corn bran, oats and re-cleaned corn screenings.	
1624C	Neozark Dairy Feed		Guarantee	12.00	3.00	10.00	53.00	Alfalfa, molasses, corn chops and corn meal.	
1624D	Neozark Sweet Feed		Guarantee	11.00	3.00	12.00	55.00	Alfalfa meal, molasses, corn chops and oats.	

NEW BOSTON, TEXAS.

221A	Cottonseed Meal	Bowie County Cotton Oil	Guarantee	44.00	7.00	11.00	25.00		
123Y	Cottonseed Meal		Found . . .	42.04	8.17	9.35	26.38		
221B	Cottonseed Cake		Guarantee	44.00	7.00	11.00	25.00		
122Y	Cottonseed Cake		Found . . .	41.78	7.27	9.79	25.68		
221C	Cottonseed Meal and Hulls		Guarantee	41.00	7.00	12.00	25.00		
221C	Cottonseed Meal and Hulls		Found . . .	40.44	8.02	10.10	25.98		
172A	Corn Chops	Simms Bros.	Guarantee	9.00	3.50	3.50	70.00		

NEW BRAUNFELS, TEXAS.

13C	Corn Chops		Guarantee	9.00	4.00	3.00	70.00		
13D	Wheat Shorts		Guarantee	14.50	3.50	5.00	60.00		
13E	Champion Mixed Feed . . .		Guarantee	13.00	3.00	6.00	62.25	Wheat bran and crushed milo.	
71T	Champion Mixed Feed . . .		Found . . .	13.15	3.28	4.07	65.76		
75T	Champion Mixed Feed . . .		Found . . .	13.90	3.34	4.84	64.29		
13F	Our Special Mixed Feed . . .		Guarantee	10.00	3.00	6.00	63.00	Corn feed meal, wheat bran and ground milo.	
85T	Our Special Mixed Feed . . .		Found . . .	13.44	4.68	5.80	61.52		
13G	Corn Chops and Corn Feed Meal.		Guarantee	8.75	3.25	3.00	68.00		

	Corn Chops and Corn Feed		Found....	9.75	4.41	2.60	71.05		
75T	Meal	H. Dittlinger Roller Mills	Found....	9.88	4.16	2.80	68.93		
83T	Corn Chops and Corn Feed		Found....	14.50	3.50	10.00	50.00		
13H	Wheat Bran and Screenings		Guarantee	8.00	3.00	4.00	68.00		
13J	Unbolted Corn Meal Feed..		Guarantee	8.00	3.00	4.00	68.00		
13K	Corn Feed Meal.....		Found....	11.79	7.22	5.73	63.57		
96T	Corn Feed Meal.....		Guarantee	9.80	2.50	3.80	65.50		Ground corn, milo, wheat, limestone, Chili seed.
13L	Peerless Chicken Feed.....		Found....	11.25	2.70	2.85	70.89		Wheat screenings.
102T	Peerless Chicken Feed.....		Guarantee	9.00	3.00	3.25	70.50		
13M	Milo and Corn Chops.....		Found....	10.31	3.52	2.64	72.53		
107T	Milo and Corn Chops.....		Guarantee	9.00	2.50	3.50	71.00		
13N	Milo Chops.....		Guarantee	9.00	5.00	10.50	63.00		
13O	Corn Bran.....		Guarantee	9.00	3.00	10.00	47.00		Ground corn and wheat screenings.
13P	Little Chick Feed.....		Guarantee	9.00	3.00	10.00	47.00		
263A	Cottonseed Meal.....		Guarantee	44.00	7.00	11.00	25.00		
263B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	25.00		
263C	Loco Mixed Feed.....	Landa Cotton Oil Co.	Guarantee	10.00	3.00	40.00	30.00		Cottonseed hulls and meal.
29T	Loco Mixed Feed.....		Found....	15.09	2.47	40.20	30.12		
38A	Wheat Bran.....		Guarantee	15.00	3.00	10.00	50.00		
38B	Wheat Shorts.....		Guarantee	16.00	3.50	5.00	55.00		
38C	Corn Chops.....		Guarantee	9.15	4.15	3.00	70.00		
81T	Corn Chops.....		Found....	10.22	4.60	3.51	70.42		
85B	Corn Chops.....		Found....	10.74	3.85	3.63	70.40		
120T	Corn Chops.....		Found....	10.75	3.89	2.77	70.99		
38D	Ear Corn Chops.....		Guarantee	8.15	3.15	8.10	65.00		
76T	Ear Corn Chops.....		Found....	10.20	4.24	3.99	76.64		
95T	Ear Corn Chops.....		Found....	10.63	3.78	3.66	70.26		
38E	Unbolted Meal.....		Guarantee	9.15	4.00	3.00	70.00		
38F	Wheat Bran and Screenings		Guarantee	15.00	3.00	10.00	50.00		
77T	Wheat Bran and Screenings		Found....	16.32	4.49	9.48	54.52		
84T	Wheat Bran and Screenings		Found....	16.56	3.90	9.75	51.94		
38G	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50		

Adul. corn bran.
Adul. corn bran.

NEW CASTLE, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
1711A	Wheat Chops.	R. S. De Long & Sons.	Guarantee	12.00	2.00	2.00	71.00	.....
2112A	Corn Chops.	New Castle Mill and Ele- vator Co.	Guarantee	9.50	3.50	3.00	70.00	.....
2112A	Corn Chops.		Found....	10.13	3.99	2.64	70.87	.....
NEW HAVEN, MISSOURI.									
1374A	Wheat Shorts.	Wolff Milling Co.	Guarantee	15.00	4.00	5.00	60.00	.....
1374B	Wheat Bran.		Guarantee	14.50	3.00	10.00	50.00	.....
1374C	Corn Chops.		Guarantee	9.00	3.50	3.50	65.50	.....
NEW ORLEANS, LOUISIANA.									
1428A	Rice Polish.	Empire Rice Mill Co.	Guarantee	11.50	7.50	1.25	65.42	.....
2001A	Dairy Feed.	J. T. Gibbons.	Guarantee	12.00	4.00	12.00	50.00	Cottonseed, alfalfa and corn meal, rice bran, brewers' grain, molasses and salt.	
2001A	Dairy Feed.		Found....	13.96	3.96	14.31	48.74		
2001B	Molasses Mixed Feed.		Guarantee	10.00	3.50	12.00	55.00	Cracked corn, crushed oats, alfalfa meal, brewers' grain, rice bran, molasses and salt.	
2001B	Molasses Mixed Feed.		Found....	11.46	3.31	13.69	52.96	.....
995A	Stafolffe Feed.	Lawrence & Hamilton Feed Co.	Guarantee	11.00	4.00	16.00	50.00	Wheat bran, alfalfa and cottonseed meal, brewers' grain, corn and molasses.	
2142A	Rice Bran.	Levy Rice Milling Co.	Guarantee	11.00	10.00	15.00	42.00	.....
2142A	Rice Bran.		Found....	11.31	11.02	13.73	42.99	.....
2142B	Rice Polish.		Guarantee	11.00	6.00	3.00	60.00	.....
2142B	Rice Polish.		Found....	11.63	11.83	3.88	56.82	.....

2066A	Rice Polish.....	Guarantee	11.50	7.00	4.00	52.00	.....
2066A	Rice Polish.....	Found....	12.39	11.88	2.48	55.50	.....
2066B	Rice Cone Meal.....	Guarantee	12.50	8.00	50.00	.....	.....
2066B	Rice Cone Meal.....	Found....	15.13	18.64	7.57	39.61	.....
2066C	Rice Bran.....	Guarantee	12.00	10.00	10.00	42.00	.....
2066C	Rice Bran.....	Found....	12.50	11.44	10.49	45.38	.....
2135A	Rice Bran and Rice Hulls.....	Guarantee	10.00	10.00	17.00	44.00	.....
2135A	Rice Bran and Rice Hulls.....	Found....	10.35	9.44	18.50	37.58	.....

NEW ULM, TEXAS.

1770A	Ear Corn Chops.....	Guarantee	8.00	3.00	7.50	64.00	.....
1770A	Ear Corn Chops.....	Found....	9.25	3.80	6.31	66.78	.....
1890A	Cold Pressed Cottonseed.....	Guarantee	26.00	6.25	26.00	28.00	.....
81T	Cold Pressed Cottonseed.....	Found....	24.91	6.93	25.75	26.44	.....

NEWTON, KANSAS.

1205A	Alfalfa Meal.....	Consolidated Alfalfa Milling Co.	Guarantee	14.00	1.20	33.00	33.00	.....
295A	Wheat Bran.....	Eagle Milling Co.	Guarantee	16.00	3.85	10.00	54.00	.....
295B	Wheat Shorts.....		Guarantee	18.00	4.75	5.00	63.00	.....
1702A	Wheat Bran.....		Guarantee	14.50	3.00	10.00	45.00	.....
1702B	Wheat Shorts.....		Guarantee	16.00	3.50	7.00	55.00	.....
1702C	Wheat Mixed Feed and Screenings.....	Empire Milling Co.	Guarantee	16.00	3.50	7.00	50.00	Wheat bran, shorts and screenings..
1702D	Wheat Bran and Screenings.....		Guarantee	14.50	3.50	7.00	50.00	.....
357A	Wheat Bran.....		Guarantee	15.00	3.50	9.50	54.00	.....
357B	Wheat Shorts.....		Guarantee	16.00	4.00	6.00	60.00	.....
357C	Wheat Mixed Feed.....		Guarantee	15.00	3.50	9.00	50.00	Wheat bran and shorts..
357D	Wheat Bran and Screenings.....		Guarantee	14.50	3.50	11.50	52.00	.....
357E	Wheat, Mixed Feed and Screenings.....	Newton Milling and Elevator Co.	Guarantee	16.00	3.50	9.00	50.00	Wheat bran, shorts and screenings..
357F	Standard Wheat Shorts and Screenings.....		Guarantee	16.00	3.50	5.50	55.00	.....

NEW YORK, NEW YORK.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Extr.	Ingredients.	Remarks.
1626A	Alstock Molasses Grains.....	Meador-Atlas Co.....	Guarantee	13.00	2.00	8.00	54.00	Dried brewers' grain and molasses..	
NINNEKAH, OKLAHOMA.									
1157A	Corn Chops.....	Ninnekah Elevator Co.....	Guarantee	9.00	3.00	3.00	71.00		
861A	Corn Chops.....	G. W. Thomas.....	Guarantee	9.00	3.00	3.00	71.00		
NIXON, TEXAS.									
855A	Corn Chops.....	Nixon Gin Co.....	Guarantee	9.00	4.00	3.00	70.00		
NOBLE, OKLAHOMA.									
544A	Corn Chops.....	Clarence Petty.....	Guarantee	9.00	4.00	3.00	70.00		
NOCONA, TEXAS.									
558A	Corn Chops.....	W. D. Carmichael.....	Guarantee	9.56	3.89	2.50	71.94		
771A	Corn Chops.....	Curlin Bros.....	Guarantee	9.00	4.00	3.00	70.00		
771B	Ear Corn Chops.....		Guarantee	8.00	3.00	9.00	65.00		
1989A	Corn Chops.....	E. L. McNabb.....	Guarantee	9.00	3.50	3.00	70.00		
714A	Corn Chops.....	Nacoma Mill and Gin Co..	Guarantee	9.00	4.00	3.00	70.00		
714C	Wheat Bran and Corn Bran		Guarantee	17.00	4.00	6.00	60.00		
714D	Wheat Chops.....		Guarantee	12.00	2.00	2.00	71.00		
714E	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.00		

1854A	Cold Pressed Cottonseed....	Planters Cotton Oil Co....	{ Guarantee 25.00 | 6.00 | 26.00 | 28.00 |	
16P	Cold Pressed Cottonseed....		{ Found . . . 25.06 8.36 22.63 30.37	

NORDHEIM, TEXAS.

1341A	Corn Chops.....	E. H. Weid.....	{ Guarantee 9.00 3.00 3.50 70.00	
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NORMAN, OKLAHOMA.

1137A	Corn Chops.....	Norman Milling and Grain Co.	{ Guarantee 9.50 4.00 3.00 70.00	
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NORMANGE, TEXAS.

1594A	Corn Chops.....	McLeroy Milling Co.....	{ Guarantee 9.00 3.50 3.00 70.00	
1490A	Corn Chops.....	Norman Gee Milling Co....	{ Guarantee | 9.00 | 3.00 | 3.50 | 70.00 |	
1490B	Barley Chops.....		{ Guarantee | 14.00 | 3.00 | 6.00 | 65.00 |	
18A	Corn Chops.....	Mrs. E. Parker & Son.....	{ Guarantee | 9.00 | 3.50 | 3.50 | 70.00 |	

NORWICH, KANSAS.

1174B	Corn Chops.....	Pankratz Milling Co.....	{ Guarantee 9.00 3.00 3.50 70.00	
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NUESERY, TEXAS.

1406A	Corn Chops.....	Wilborn & Brown Milling Co.	{ Guarantee 9.00 3.00 3.50 70.00	
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O'BRIEN, TEXAS.

2110A	Milo Chops.....	Farmers District Union Mill and Elevator Co.	{ Guarantee 10.00 2.50 3.00 71.00	
2110A	Milo Chops.....		{ Found . . . | 10.84 | 3.12 | 2.86 | 68.86 |	
2110B	Wheat Chops.....		{ Guarantee | 15.00 | 2.00 | 3.50 | 65.00 |	
2110B	Wheat Chops.....		{ Found . . . | 14.60 | 1.99 | 3.47 | 66.06 |	
2110C	Corn Chops.....		{ Guarantee | 9.50 | 3.50 | 3.00 | 70.00 |	
2110C	Corn Chops.....		{ Found . . . | 9.81 | 5.03 | 2.37 | 68.08 |	
2110D	Wheat Mixed Feed.....		{ Guarantee | 16.00 | 3.60 | 8.00 | 55.00 |	Wheat bran and shorts.
2110D	Wheat Mixed Feed.....		{ Found . . . | 18.57 | 3.28 | 6.55 | 56.14 |	

OCHILTREE, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen.	Phos- phorus.	Ingredients.	Remarks.
1832A	Wheat Shorts.....	Ochiltree Roller Mills.....	Guarantee	15.50	3.50	5.00	60.00	.....	.....	.....
1832A	Wheat Shorts.....		Found....	12.84	2.50	2.14	68.60	.....	.....	.....
1832B	Mixed Chops.....		Guarantee	10.00	2.25	5.00	68.00	.....	Barley and milo chops.	.....
1832B	Mixed Chops.....		Found....	9.71	2.27	5.97	67.10	.....	.....	.....
1832C	Wheat Bran and Screenings		Guarantee	15.00	3.50	10.00	55.00	.....	.....	.....
1832C	Wheat Bran and Screenings		Found....	14.38	3.32	5.74	58.66	.....	.....	.....

ODEM, TEXAS.

2039A	Corn Chops.....	Odem Milling Co.....	Guarantee	9.00	3.50	3.50	70.00	.....	.....	.....
2039A	Corn Chops.....		Found....	11.83	4.02	2.14	69.24	.....	.....	.....

ODESSA, TEXAS.

2097A	Milo Head Chops.....	E. V. Graham & Co.....	Guarantee	9.75	2.40	7.50	65.00	.....	.....	.....
2097A	Milo Head Chops.....		Found....	8.55	2.14	6.34	66.61	.....	.....	.....
2097B	Milo Chops.....		Guarantee	9.75	2.50	3.00	68.00	.....	.....	.....
2097B	Milo Chops.....		Found....	10.63	2.61	3.15	71.60	.....	.....	.....

OGLESBY, TEXAS.

2008A	Wheat Bran.....	Oglesby Roller Mills.....	Guarantee	15.00	3.50	9.00	55.00	.....	.....	.....
2008A	Wheat Bran.....		Found....	18.27	4.21	7.54	54.48	.....	.....	.....
2008B	Wheat Bran and Screenings		Guarantee	15.00	3.50	9.00	54.00	.....	.....	.....
2008B	Wheat Bran and Screenings		Found....	17.22	3.81	7.55	56.78	.....	.....	.....
2008C	Mixed Bran and Screenings		Guarantee	15.00	3.75	9.00	52.00	.....	Wheat and corn bran and screenings	.....
2008C	Mixed Bran and Screenings		Found....	16.50	3.94	7.13	55.91	.....	.....	.....
2008D	Corn Chops and Corn Bran		Guarantee	9.50	3.50	3.00	70.00	.....	.....	.....
2008D	Corn Chops and Corn Bran		Found....	10.19	4.10	2.58	69.38	.....	.....	.....

OKEENE, OKLAHOMA.

163A	Wheat Bran.....	Guarantee	15.72	4.16	8.42	54.05	
163B	Wheat Shorts.....	Guarantee	16.87	4.68	3.63	63.11	
163C	Wheat Bran and Shorts.....	Guarantee	16.75	4.11	6.02	58.50	

OKLAHOMA CITY, OKLAHOMA.

135A	Corn Chops.....	Guarantee	9.00	3.00	3.00	70.00	
135B	Wheat Bran.....	Guarantee	14.00	3.00	10.00	50.00	
135C	Wheat Shorts.....	Guarantee	16.00	4.00	5.00	53.00	
135D	Wheat Mixed Feed.....	Guarantee	15.00	4.00	10.00	50.00	Wheat bran and shorts.....
1672A	Barteldes O. K. Dry Mash..	Guarantee	15.00	11.06	14.06	57.07	Corn, alfalfa, bone and meat meal, linseed oil and blood meal, charcoal and wheat bran.
1672B	Barteldes O. K. Scratching Food with Grit and Oyster Shell.	Guarantee	11.94	3.50	4.08	34.71	White kafir, cracked corn and milo, wheat, sunflower seed, charcoal, mica spar, grit, oyster shell, oats or barley, ground bone and beef scrap.
1672C	Barteldes O. K. Chick Food with Grit.	Guarantee	12.08	3.60	2.07	68.72	Corn, milo, kafir and hemp seed cracked millet, ground bone, meat meal, charcoal and mica grit.
1672D	Barteldes O. K. Pigeon Food	Guarantee	13.05	3.05	3.00	71.00	Cane, milo, millet, peas, kafir and corn cracked and wheat.
705A	Corn Chops.....	Guarantee	8.81	3.81	2.26	72.71	
1135A	Corn Chops.....	Guarantee	9.00	3.50	3.50	70.00	
1452A	Wheat Bran.....	Guarantee	14.00	3.00	8.00	50.00	
1452B	Corn Chops.....	Guarantee	9.54	3.93	2.58	70.98	
624A	Cottonseed Cake.....	Guarantee	44.00	7.00	11.00	24.00	
315A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	
315B	Wheat Bran.....	Guarantee	14.50	3.50	10.00	50.00	
315C	Wheat Shorts.....	Guarantee	16.00	4.60	5.40	56.00	
315D	Wheat Mixed Feed.....	Guarantee	16.00	4.00	9.00	53.00	Wheat bran and shorts.....

OKLAHOMA CITY, OKLAHOMA—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Extract.	Ingredients.	Remarks.
315E	Kafir Meal.....	Oklahoma City Mill and Elevator Co.—Cont'd.	Guarantee	10.30	3.00	2.80	71.60	.....
315F	Wheat Mixed Feed and Screenings.		Guarantee	16.00	4.00	9.00	53.00	Wheat, bran, shorts and screenings	
69T	Wheat Mixed Feed and Screenings.		Found.	18.45	3.83	9.05	52.05	.....
72T	Wheat Mixed Feed and Screenings.		Found.	18.19	5.22	9.31	52.03	.....
315G	Wheat Bran and Screenings	C. Y. Sample.....	Guarantee	14.50	3.50	10.00	50.00	.....
315H	Standard Wheat Shorts and Screenings.		Guarantee	18.00	4.50	6.00	56.00	.....
1493A	Corn Chops.....		Guarantee	9.54	3.99	2.58	70.98	.....
1493B	Kafir Chops.....		Guarantee	9.73	2.61	2.56	67.99	.....
1493C	Wheat Bran.....	Standard Milling Co.....	Guarantee	16.20	3.75	8.57	54.69	.....
1493D	Hog-O-Mixed Feed.....		Guarantee	14.38	3.65	3.60	65.52	Wheat shorts and ground kafir	
1493E	Hereford Mixed Feed.....		Guarantee	13.82	3.44	6.17	61.85	Wheat and kafir bran	
1016A	Corolla.....		Guarantee	12.00	2.50	16.00	55.00	Corn and alfalfa meal	

OLNEY, TEXAS.

1277A	Corn Chops.....	O. T. Anderson & Co.....	Guarantee	9.00	3.00	3.50	70.00	
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OKMULGEE, OKLAHOMA.

1241A	Corn Chops.....	Okmulgee Mill and Elevator Co.	Guarantee	9.00	3.50	3.00	70.00	
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OMAHA, NEBRASKA.

		Guarantee	10.50	2.00	12.00	55.00	Cracked corn, oats, alfalfa meal and salt.
1468A	Perfection Horse Feed.....	Guarantee	10.50	2.00	12.00	55.00	Cracked corn, oats, alfalfa meal and salt.
1468B	Green Meadow Dairy Feed.....	Guarantee	11.00	1.00	25.00	48.00	Molasses and alfalfa meal.....
1468C	Cream Alfalfa Dairy Feed.....	Guarantee	11.00	2.25	15.00	55.00	Corn and alfalfa meal and molasses
1468D	Alfalfa Horse and Mule Feed.....	Guarantee	10.00	2.00	12.00	55.00	Cracked corn, oats, alfalfa meal and molasses.
1468E	Peerless Alfalmo Horse Feed.....	Guarantee	10.00	2.00	12.00	55.00	Cracked corn, oats, alfalfa meal and molasses.
1468F	O. K. Horse Feed.....	Guarantee	10.00	2.00	12.00	55.00	Corn, alfalfa meal and oats.....
1468G	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	.....
1468H	Alfalmo.....	Guarantee	11.00	1.00	25.00	48.00	Alfalfa meal and molasses.....
1468I	Alfalfa Meal.....	Guarantee	13.00	1.50	33.00	40.00	.....
1468J	Al-Corn-O Horse Feed.....	Guarantee	10.00	2.00	12.00	55.00	Corn, oats, alfalfa meal and molasses

Omaha Alfalfa Milling Co.

OMAHA, TEXAS.

		Guarantee	44.00	7.00	11.00	24.00	Adulterated hulls.
863A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	24.00	Adulterated hulls.
113Y	Cottonseed Meal.....	Found.....	38.88	7.98	10.88	26.59	Adulterated hulls.

OMAHA, NEBRASKA.

		Guarantee	9.00	2.00	15.00	59.00	Cracked corn, whole oats, alfalfa and molasses.
1470A	Arab Horse Feed.....	Guarantee	9.00	2.00	15.00	59.00	Cracked corn, whole oats, alfalfa and molasses.
1470B	June Pasture Dairy Feed.....	Guarantee	10.00	.50	26.00	44.00	Alfalfa and molasses.....
1470C	Alfal-Fat Sugar Meal.....	Guarantee	10.00	.50	26.00	46.00	Alfalfa and molasses.....
1470D	Lucern Alfalfa Meal.....	Guarantee	12.00	1.00	33.00	35.00	.....

M. C. Peters Mill Co.....

ORANGE, TEXAS.

		Guarantee	12.00	6.00	4.00	65.00	
597A	Rice Polish.....	Guarantee	12.00	6.00	4.00	65.00	
34Y	Rice Polish.....	Found.....	12.94	7.32	1.90	68.55	
597B	Rice Bran.....	Guarantee	12.00	10.00	15.00	40.00	
35Y	Rice Bran.....	Found.....	13.50	14.23	13.15	38.12	
597C	Ground Rice.....	Guarantee	8.00	2.00	8.00	60.00	
73R	Rice Bran.....	Found.....	12.56	13.99	15.32	39.08	

Orange Rice Mill Co.....

ORANGE, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Free Extract.	Ingredients.	Remarks.
597E	Stoklikit Dairy Feed.....		Guarantee	12.00	4.50	18.00	44.00	Rice bran, alfalfa and cottonseed meal, cottonseed hulls, milo head chops and molasses.	
597E	Stoklikit Dairy Feed.....		Found.....	10.66	4.33	18.42	45.15		
597F	Steam Cooked Molasses Horse and Mule Feed.		Guarantee	11.00	4.50	12.00	53.00	Corn, oats, oat feed, cottonseed meal, rice bran, alfalfa and molasses.	
597G	Corn Chops.....		Guarantee	9.23	3.85	2.23	70.97		
597H	Dry Mixed Feed.....		Guarantee	10.00	5.00	12.00	60.00	Corn, oats, oat feed, rice bran, rice polish and molasses.	
597I	Steam Cooked Molasses Hog Feed.		Guarantee	10.50	6.00	10.00	53.00	Rice polish, rice bran, corn and molasses.	
597J	Special Steam Cooked Mixed Feed.	Orange Rice Mill Co.....	Guarantee	10.00	5.00	12.00	63.00	Rice bran, rice polish, oats, oat hulls, corn and molasses.	
597L	Corn and Milo Chops.....		Guarantee	9.00	3.00	3.00	60.00		
597M	Stoklikit Handy Steam Cooked Feed with Humus.		Guarantee	9.25	3.75	14.75	50.00	Ground milo heads, milo chops, rice bran, ground peanut vine and rice straw, blackstrap molasses, humus and salt.	
597M	Stoklikit Handy Steam Cooked Feed with Humus.		Found.....	11.39	4.90	9.04	56.01		
597O	Stoklikit Chicken Feed.....		Guarantee	9.00	3.00	5.00	60.00	Milo, corn and rice screenings.....	
597P	Stoklikit Regular Steam Cooked Molasses Feed.		Guarantee	11.00	3.50	12.00	50.00	Corn, milo, alfalfa and cottonseed meal, rice bran and blackstrap molasses.	
597P	Stoklikit Regular Steam Cooked Molasses Feed.		Found.....	9.27	5.41	9.43	57.03		
597Q	Milo Chops.....		Guarantee	10.14	2.74	2.58	72.16		
597R	The Farmers' Pride Mixed Feed.		Guarantee	9.00	2.50	13.00	55.00	Ground milo heads and blackstrap molasses.	
597R	The Farmers' Pride Mixed Feed.		Found.....	8.79	2.84	7.06	68.54		

OSAGE, TEXAS.

1233A	Corn Chops.....	J. F. Fleming.....	Guarantee	9.00	4.00	3.00	70.00
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OSWEGO, KANSAS.

179A	Wheat Chops.....	Oswego Milling Co.....	Guarantee	14.00	3.50	10.00	50.00
179B	Corn Chops.....		Guarantee	9.00	3.50	3.00	60.00
540A	Corn Chops.....	Pearl Roller Mills.....	Guarantee	9.60	3.90	2.52	71.71
540B	Mixed Feed.....		Guarantee	15.56	3.38	8.43	56.05
							Wheat bran and shorts.....

OTTINE, TEXAS.

1981A	Corn Chops.....	B. Zedler.....	Guarantee	9.00	3.50	3.00	70.00
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OWENSBORO, KENTUCKY.

1714A	Alfalfa Horse and Mule Feed	Rapier Sugar Feed Co.....	Guarantee	11.00	2.50	12.00	50.00
1714B	Creamo Dairy Feed.....		Guarantee	16.50	3.50	12.00	46.00
1714C	Otene Horse and Mule Feed		Guarantee	10.00	2.50	12.00	50.00
1714D	Rapier's Mixing Feed.....		Guarantee	12.00	2.50	12.00	46.00
							Molasses, alfalfa, cracked corn, salt linseed meal, rolled barley and re-cleaned grain screenings.
							Molasses, cottonseed and linseed meal, ground and bolted screenings, clipped oat refuse and salt.
							Re-cleaned grain screenings, cracked corn, linseed meal, rolled oats and salt.
							Grain screenings, clipped oat refuse molasses, linseed meal, gluten and salt.

OXARKS, MISSOURI.

1240A	Corn Chops.....	Ozark Water Mill.....	Guarantee	9.00	3.00	3.50	70.00
1240B	Wheat Bran.....		Guarantee	14.50	3.50	10.00	50.00
1240C	Wheat Shorts.....		Guarantee	16.00	4.00	5.00	60.00

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Ex- tract.	Ingredients.	Remarks.
1986A	Corn Chops.	Paduach Milling Co.	Guarantee	9.00	3.50	3.00	70.00		
2067A	Milo Head Chops.	Willett Milling Co.	Guarantee	10.00	2.50	7.50	71.00		
2067A	Milo Head Chops.		Found	10.50	2.69	5.70	66.72		
2067B	Corn Chops.		Guarantee	9.50	3.50	3.00	70.00		
2067B	Corn Chops.		Found	10.44	4.38	2.45	70.69		
2067C	Milo Chops.		Guarantee	10.00	2.50	3.00	71.00		
2067C	Milo Chops.		Found	9.91	2.45	2.34	74.00		
PALESTINE, TEXAS.									
820A	Cottonseed Meal.	Anderson County Cotton Oil Co.	Guarantee	44.00	7.00	9.00	22.00		
52R	Cottonseed Meal.		Found	45.19	8.86	7.40	25.03		
6Y	Cottonseed Meal.		Found	47.13	8.04	6.46	24.86		
2034A	Corn Chops.	Morris Gin and Machinery Co.	Guarantee	9.00	3.50	3.00	70.00		
2034A	Corn Chops.		Found	8.35	4.17	2.63	70.72		
1442A	Wheat Bran.		Guarantee	14.50	3.50	10.00	52.00		
1442B	Corn Chops.		Guarantee	9.00	3.50	3.00	70.00		
1442C	Milo Chops.		Guarantee	9.50	2.50	3.00	71.00		
1442D	Elberta Brand Kafir Chops.		Guarantee	9.50	2.75	3.00	71.00		
1442E	Elberta Brand Mixed Feed.		Guarantee	10.50	3.00	4.50	66.00	Milo chops and wheat bran.	
61R	Elberta Brand Mixed Feed.	Palestine Grain Co.	Found	10.88	3.09	3.78	68.05		
1442F	Prize Winner Chick Feed with Oyster Shell.		Guarantee	9.00	1.50	3.00	65.00	Oyster shell, wheat, corn chops, milo and sunflower seed.	
1442G	Prize Winner Chicken Feed with Oyster Shell.		Guarantee	10.75	2.00	3.75	66.50	Oyster shell, wheat screenings, corn chops, milo and sunflower seed.	
1442H	Mixed Chops.		Guarantee	9.50	3.00	3.00	70.50	Milo and corn chops.	

1442I	Mixed Feed.....	Guarantee	10.75	4.40	19.50	42.74	Ground rice hulls, rice bran, rice polish and wheat bran.
1442J	Elberta Brand Wheat Bran and Screenings.	Guarantee	15.50	3.50	10.50	53.00	
1442K	Corn Chops and Corn Bran	Guarantee	9.00	3.50	3.10	69.00	

PAMPA, TEXAS.

2118A	Cottonseed Cake.....	Guarantee	44.00	7.00	11.00	23.00	
2118A	Cottonseed Cake.....	Found....	46.07	6.44	8.97	25.34	
2130A	Milo Chops.....	Guarantee	10.00	2.50	3.00	70.50	
2130A	Milo Chops.....	Found....	10.19	2.67	2.40	69.57	
2006A	Milo Chops.....	Guarantee	10.00	2.50	3.00	70.50	
2006A	Milo Chops.....	Found....	12.83	3.39	1.91	67.91	

PANHANDLE, TEXAS.

1950A	Milo Chops.....	Guarantee	10.00	2.50	3.00	70.50	
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PARIS, TEXAS.

2020A	Corn Chops and Corn Bran	Guarantee	9.00	3.50	3.00	70.00	
2020A	Corn Chops and Corn Bran	Found....	11.04	4.65	2.85	69.51	
2020B	Milo Chops.....	Guarantee	10.00	2.50	3.00	70.50	
2020B	Milo Chops.....	Found....	11.67	2.51	2.07	72.82	
2020C	Red Bird Poultry Food.....	Guarantee	9.00	3.00	3.00	70.00	Milo, corn chops and wheat screenings.
2020C	Red Bird Poultry Food.....	Found....	10.06	3.18	2.25	70.01	
537A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	24.00	
537B	Mixed Feed.....	Found....	42.59	7.72	10.24	26.26	
65Y	Mixed Feed.....	Guarantee	9.50	3.00	45.00	30.00	Cottonseed hulls and meal.
537C	Cottonseed Cake.....	Found....	7.75	1.45	46.23	31.82	
537D	Cottonseed Meal and Hulls	Guarantee	44.00	7.00	11.00	24.00	
537D	Cottonseed Meal and Hulls	Guarantee	40.00	6.00	12.00	23.00	
537D	Cottonseed Meal and Hulls	Found....	40.10	6.05	11.06	27.79	

Adulterated hulls.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen- Ex- tract.	Ingredients.	Remarks.
1923A	Milo Head Chops.....	Paris Fuel Co.....	Guarantee	9.50	2.25	7.50	65.00	.....
1923B	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50	.....
1923C	Milo and Corn Chops.....		Guarantee	9.50	3.00	3.00	70.25	.....
1923D	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....
9A	Corn Chops.....	Paris Milling Co.....	Guarantee	9.00	3.50	3.50	70.00	.....
9B	Wheat Bran.....		Guarantee	16.12	4.12	8.66	56.92	.....
9D	Wheat Shorts.....		Guarantee	15.50	3.50	4.00	60.00	.....
9E	Wheat Bran and Corn Bran		Guarantee	16.39	4.42	9.03	55.52	.....
9F	Corn Chops and Corn Bran		Guarantee	9.00	3.50	3.50	70.00	.....
9G	Poultry Food.....		Guarantee	9.00	3.05	3.05	70.00	Kafir, corn chops and screenings.....	
9H	Mixed Feed.....		Guarantee	15.50	3.50	11.00	52.00	Wheat bran, kafir chops, and wheat screenings.....	
9I	Kafir Chops.....	Southland Cotton Oil Co...	Guarantee	10.25	2.75	2.75	68.75	.....
9J	Wheat Bran, Screenings and Corn Bran.....		Guarantee	16.39	4.42	9.03	55.52	.....
9K	Milo Chops.....		Guarantee	10.25	2.75	2.75	68.75	.....
280A	Cottonseed Meal.....	Southland Cotton Oil Co...	Guarantee	44.00	7.00	11.00	24.00	.....	Adulterated hulls.
68Y	Cottonseed Meal.....		Found.....	40.94	6.97	12.05	27.10	.....
280B	Mixed Hulls and Meal.....		Guarantee	10.50	3.00	43.00	30.00	.....	Excess hulls.
67Y	Mixed Hulls and Meal.....		Found.....	5.19	1.24	46.58	33.91	.....
280C	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	24.00	.....
280D	Cottonseed Meal and Hulls		Guarantee	40.00	6.00	12.00	27.00	.....
280D	Cottonseed Meal and Hulls		Found.....	42.13	7.20	11.20	27.50	.....
280E	Mixed Hulls and Meal.....		Guarantee	6.63	1.46	42.75	35.91	.....	Excess hulls.
280E	Mixed Hulls and Meal.....		Found.....	5.83	1.27	44.61	36.51	.....
280F	Cottonseed Cake and Hulls		Guarantee	41.00	6.00	12.00	27.00	.....

PARK SPRINGS, TEXAS.

1398A	Corn Chops.....	J. M. Mitchum.....	Guarantee	9.00	3.50	3.00	70.00
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PAULS VALLEY, OKLAHOMA.

1038A	Corn Chops.....	Pauls Valley Milling Co.	Guarantee	9.54	3.99	2.58	70.80
1038B	Wheat Bran.....		Guarantee	16.20	3.73	8.57	54.89	.....
1038C	Kafir Chops.....		Guarantee	9.50	3.02	3.00	71.00	.....
1038D	Wheat Shorts.....		Guarantee	16.00	4.00	5.00	60.00	.....
1038E	Ground Corn Bran.....		Guarantee	8.50	4.34	10.00	65.00	.....
1118A	Corn Chops.....	Mitchel Grain Co.....	Guarantee	9.00	3.50	3.50	70.00

PEARL, TEXAS.

1516A	Corn Chops.....	C. L. Elam.....	Guarantee	9.00	3.50	3.00	70.00
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PEARSALL, TEXAS.

1988A	Corn Chops.....	S. W. Curtis.....	Guarantee	9.00	3.50	3.00	70.00
699A	Cold Pressed Cottonseed	Frio Cotton Oil Co.....	Guarantee	27.00	6.00	23.00	27.00
68P	Cold Pressed Cottonseed		Found.....	25.91	8.19	26.32	28.17	.....

PECAN GAP, TEXAS.

132A	Cottonseed Meal.....	Pecan Gap Cotton Oil Co..	Guarantee	44.00	7.00	9.00	22.00	.....
63Y	Cottonseed Meal.....		Found.....	39.44	8.27	11.39	27.11	.....
132B	Cottonseed Cake.....		Guarantee	44.00	8.00	8.00	24.00	.....
132C	Cottonseed Meal and Hulls.....		Guarantee	43.00	7.00	12.00	23.00	.....
132C	Cottonseed Meal and Hulls.....		Found.....	41.94	7.28	10.46	26.04	.....

Adulterated hulls.

PECOS, TEXAS.

32A	Alfalfa Meal.....	Pecos Alfalfa Milling Co.....	Guarantee	8.27	1.01	41.30	32.00	.....
1481A	Milo Head Chops.....	Pecos Mercantile Co.....	Guarantee	9.25	2.42	5.49	70.50	.....

PECOS, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Ex- tract.	Ingredients.	Remarks.
1909A	Hen Food	Prewit & Wadley	Guarantee	10.50	2.50	4.00	71.50	Wheat, milo, corn, kafir, oats, corn chops, sunflower seed and char- coal.	

PIERCE CITY, MISSOURI.

128A	Corn Chops	J. W. Vance.	{	Guarantee	9.00	4.00	3.50	70.00	
128B	Diamond Mixed Feed		{	Guarantee	14.50	3.50	10.00	55.00	Wheat bran and shorts
128C	Diamond Wheat Bran		{	Guarantee	14.50	3.50	10.00	55.00	
128D	Wheat Bran and Mill Run screenings.		{	Guarantee	14.50	3.50	10.00	55.00	
128E	Wheat Shorts		{	Guarantee	15.00	4.00	5.00	55.00	

PENELOPE, TEXAS.

733A	Corn Chops	Droz & Parma	{	Guarantee	9.00	4.00	3.00	70.00	
733B	Chopped Ear Corn		{	Guarantee	8.50	3.50	6.00	65.00	

PERRIN, TEXAS.

2091A	Wheat Bran and Shorts	Perrin Milling Co.	{	Guarantee	16.00	4.00	8.40	50.00	
2091A	Wheat Bran and Shorts		{	Found	17.06	3.68	5.73	68.16	

PERRY, OKLAHOMA.

123A	Corn Chops	Perry Mill Co.	{	Guarantee	9.25	4.10	2.50	71.50	
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PETERSBURG, TEXAS.

2125A	Milo Head Chops	W. H. Platt	{	Guarantee	9.75	2.40	7.50	65.00	
2125A	Milo Head Chops		{	Found	8.49	2.16	6.45	64.65	

PETROLIA, TEXAS.

1088A	Corn Chops.		Guarantee	9.00	3.50	3.00	70.00
1088B	Kafir Chops.	Petrolia Grain Co.	Guarantee	9.50	2.75	3.00	71.00
1088C	Milo Chops.		Guarantee	9.50	2.50	3.00	71.00

PFLUGERVILLE, TEXAS.

1683A	Corn Chops.	F. W. Neuenchwander.	Guarantee	9.00	3.50	3.00	70.00
1130A	Cottonseed Meal.		Guarantee	44.00	7.00	11.00	22.00
56B	Cottonseed Meal.	Pflugerville Cottonseed Oil	Found	38.85	7.83	14.27	24.68
1130B	Cottonseed Meal and Hulls	Co.	Guarantee	38.00	5.00	15.00	23.00
1130B	Cottonseed Meal and Hulls		Found	42.86	6.34	12.16	25.00

Adulterated hulls.

PHARR, TEXAS.

2164A	Corn Chops.		Guarantee	9.50	3.50	3.00	70.00
2164A	Corn Chops.		Found	10.44	4.11	2.73	70.27
118T	Corn Chops.	Pharr Mill and Elevator	Found	11.05	3.73	2.31	71.59
2164B	Alfalfa Meal.	Co.	Guarantee	13.50	1.50	30.00	36.00
2164B	Alfalfa Meal.		Found	16.25	2.29	22.07	39.48

PHOENIX, ARIZONA.

1788A	Alfalfa Meal.		Guarantee	14.00	2.00	30.00	33.00
1788B	Taffa Falfa	Arizona Alfalfa Mill Co.	Guarantee	11.00	1.25	25.00	43.00

Molasses and alfalfa.

PILOT POINT, TEXAS.

491A	Cottonseed Meal.		Guarantee	44.00	7.00	11.00	22.00
103Y	Cottonseed Meal.		Found	43.25	6.68	10.75	25.32
491B	Screened Cottonseed Cake.		Guarantee	44.00	7.00	11.00	22.00
102Y	Screened Cottonseed Cake.	Pilot Point Cotton Oil Mill	Found	45.44	6.65	8.94	25.18
491C	Mixed Feed.	Co.	Guarantee	11.00	3.00	40.00	30.00
101Y	Mixed Feed.		Found	9.37	1.61	40.92	34.26
3A	Wheat Bran.		Guarantee	14.50	3.00	8.00	48.00
3B	Corn Chops.	Pilot Point Roller Mills	Guarantee	9.00	3.00	3.00	70.00
3C	Wheat Shorts.	Co.	Guarantee	13.00	3.00	4.00	55.00
3D	Mixed Bran.		Guarantee	14.00	3.50	10.00	50.00

Excess hulls.

Wheat and corn bran.

PINE BLUFF, ARKANSAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
1238A	Corn Chops.....	Marco Mills.....	Guarantee	9.00	3.50	3.50	70.00	.....
1238B	Marco Mixed Feed.....		Guarantee	10.50	3.50	14.00	56.00	Oats, corn, alfalfa meal and hominy feed	
1238C	Hominy Feed.....		Guarantee	11.00	6.00	7.50	60.00	.....
1238D	Marco Dairy Feed.....		Guarantee	9.00	3.50	16.00	54.00	Alfalfa meal, hominy feed meal and molasses.	
1238E	Croesus Mixed Feed.....		Guarantee	10.00	4.00	8.00	63.00	Wheat bran, hominy feed, crushed oats and molasses.	
1238F	Jockey Horse and Mule Feed.....		Guarantee	9.75	2.50	15.00	55.00	Hominy feed, corn chops, alfalfa meal and molasses.	
1238G	Mixed Feed.....		Guarantee	10.00	3.50	17.00	50.00	Wheat bran, hominy feed and ground cottonseed hulls.	
1238G	Mixed Feed.....		Found....	11.25	5.48	17.53	50.07	.....
1921A	Mixed Feed.....	Westbrook Grain and Com- mission Co.	Guarantee	14.00	2.00	8.00	51.00	Rice, wheat, corn bran, rice polish and screenings.	
1921B	Mixed Feed.....		Guarantee	12.50	6.00	10.00	51.00	Wheat shorts, rice bran and polish...	

PITTSBURG, TEXAS.

2030A	Corn Chops.....	D. E. Blount.....	Guarantee	9.00	3.50	3.00	70.00	.....
2030A	Corn Chops.....		Found....	8.18	3.77	2.32	73.00	.....
580A	Cottonseed Meal.....	Pittsburg Cotton Oil Co....	Guarantee	44.00	7.00	11.00	24.00	.....
47Y	Cottonseed Meal.....		Found....	44.82	7.81	8.28	25.72	.....
580B	Corn Chops.....		Guarantee	10.00	4.00	3.00	69.00	.....

PLAINVIEW, TEXAS.

898A	Milo Chops.....	Cobb Grain Co.....	Guarantee	9.00	2.90	2.42	74.50	
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		E. T. Coleman Coal and Grain Dealers.							
1605A 1605B 1605C 1605D	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00			
	Milo Chops.....	Guarantee	9.50	2.50	3.00	71.00			
	Kafir Chops.....	Guarantee	9.50	2.75	3.00	71.00			
	Wheat and Oat Chops.....	Guarantee	12.00	2.50	7.00	58.00			
199A 199B 199C 199D 199E 199F 199G	Kafir Head Chops.....	Guarantee	7.00	2.00	8.00	60.00			
	Corn Chops.....	Guarantee	9.00	3.00	3.00	70.00			
	Wheat Chops.....	Guarantee	15.00	2.00	3.50	65.00			
	Kafir Chops.....	Guarantee	8.00	2.50	3.00	70.00			
755A 755B 755C 755D 755E	Corn Bran.....	Guarantee	8.00	4.00	12.00	50.00			
	Milo Head Chops.....	Guarantee	9.50	2.25	7.50	65.00			
	Milo Chops.....	Guarantee	10.00	2.50	3.00	70.50			
	Wheat Bran and Shorts.....	Guarantee	16.00	4.00	6.00	55.00			
755F 755G 755H 755I	Corn Chops.....	Guarantee	9.50	3.50	3.00	70.00			
	Corn Chops.....	Found....	10.00	4.34	2.25	69.59			
	Milo Chops.....	Guarantee	9.00	3.00	3.00	70.00			
	Wheat Shorts.....	Guarantee	17.00	3.80	4.50	60.00			
Harvester Queen Mills.	Wheat Shorts.....	Found....	18.24	4.50	4.94	56.65			
	Mixed Feed.....	Guarantee	12.50	3.50	4.50	62.50	Wheat bran, kafir chops and corn bran.		
755F 755G 755H 755I	Mixed Bran.....	Guarantee	16.00	4.00	6.00	55.00	Wheat and corn bran.		
	White Middlings.....	Guarantee	12.00	2.00	5.00	55.00			
	Wheat Chops.....	Guarantee	15.00	2.00	5.00	60.00			
	Kafir Chops.....	Guarantee	9.00	3.00	3.00	70.00			
PLANO, TEXAS.									
283A 283C 283D 283E	Corn Chops.....	Guarantee	9.00	3.50	3.00	68.00			
	Wheat Bran.....	Guarantee	14.50	3.50	10.00	50.00			
	Milo Chops.....	Guarantee	9.50	2.50	3.00	71.00			
	Kafir Chops.....	Guarantee	9.50	2.75	3.00	71.00			
1799A	Corn Chops.....	Guarantee	9.00	3.00	2.50	70.00			
	Cottonseed Meal.....	Guarantee	45.00	6.00	11.00	24.00			
495A 85Y 495B 84Y 495C	Cottonseed Meal.....	Found....	44.00	6.17	10.91	24.63			
	Monarch Mixed Feed.....	Guarantee	9.50	3.00	45.00	30.00	Cottonseed hulls and meal.		
	Monarch Mixed Feed.....	Found....	8.86	1.19	43.04	33.71			
	Cottonseed Cake.....	Guarantee	44.00	7.00	11.00	24.00			

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen & Phos- phorus	Ingredients.	Remarks.
2021A	Wheat Shorts.....	{ Plano Mill and Ice Co..... }	Guarantee	17.00	3.50	4.50	60.00	.....
2021A	Wheat Shorts.....		Found.	13.24	1.61	1.11	72.22	.....
2021B	Wheat Bran.....		Guarantee	16.00	3.50	9.50	55.00	.....
2021B	Wheat Bran.....		Found.	16.66	3.83	5.92	56.34	.....
137A	Corn Chops.....	Stark Grain Co.....	Guarantee	9.00	4.00	3.50	68.00	.....
PONCA CITY, OKLAHOMA.									
414A	Corn Chops.....	{ Ponca City Milling Co..... }	Guarantee	9.00	4.00	3.00	70.00	.....
414B	Wheat Bran.....		Guarantee	14.00	3.50	10.00	50.00	.....
POND CREEK, OKLAHOMA.									
654A	Corn Chops.....	Andrew O. Crist.....	Guarantee	9.00	4.00	3.00	70.00	.....
97A	Corn Chops.....	Kelly Mill and Elevator Co..	Guarantee	9.00	4.00	3.00	70.00	.....
PORTER, OKLAHOMA.									
115A	Corn Chops.....	Porter Mill and Elevator Co.	Guarantee	9.00	3.50	3.00	70.00	.....
PORT ARTHUR, TEXAS.									
873A	Cottonseed Meal.....	Port Arthur Export Co.....	Guarantee	44.00	7.00	9.00	23.00	.....
422A	Rice Bran.....	{ Port Arthur Rice Milling Co. }	Guarantee	11.00	10.00	12.00	48.00	.....
422B	Rice Polish.....		Guarantee	10.00	6.00	2.00	70.00	.....

PORT LAVACA, TEXAS.

687A	Corn Chops.....	J. A. Michot & Son.....	{ Guarantee 9.00	3.50	3.00	70.00
687B	Milo Chops.....		{ Guarantee 9.50	2.75	3.00	68.00
687B	Milo Chops.....		{ Found.... 9.69	2.87	2.17	70.84

POST CITY, TEXAS.

2082A	Milo Chops.....	Jno. R. Williams.....	{ Guarantee 10.00	2.50	3.00	71.00
2082A	Milo Chops.....		{ Found.... 13.35	2.80	2.18	70.11
2082B	Milo Head Chops.....		{ Guarantee 9.75	2.40	7.50	65.00
2082B	Milo Head Chops.....		{ Found.... 10.31	2.24	8.33	66.55

PRAIRIE DU ROCHER, ILLINOIS.

1947A	Wheat Bran and Screenings	Schoening-Koenigsmark	{ Guarantee 14.00	3.50	11.00	52.00
1947B	Wheat Middlings and Screenings.	Milling Co.	{ Guarantee 16.00	4.00	6.00	54.00

PRESIDIO, TEXAS.

2052A	Wheat Bran.....	Bob Daly.....	{ Guarantee 15.00	3.50	9.00	54.00
2052A	Wheat Bran.....		{ Found.... 16.63	3.15	7.34	61.61
2022A	Wheat Bran.....	Enrique Montemeyar.....	{ Guarantee 15.00	3.50	9.50	55.00
2022A	Wheat Bran.....		{ Found.... 16.97	3.11	7.59	62.40

PROCTOR, TEXAS.

1946A	Corn Chops.....	L. A. South.....	{ Guarantee 9.00	3.50	3.00	70.00
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PROSPER, TEXAS.

1126A	Corn Chops.....	Baker Brothers.....	{ Guarantee 9.00	3.75	3.00	65.00
1122A	Wheat Bran.....		{ Guarantee 15.00	3.50	10.00	50.00
1122B	Corn Chops.....	Lone Star Milling and Grain Co.	{ Guarantee 9.00	3.75	3.00	65.00
1122C	Wheat Shorts.....		{ Guarantee 14.50	3.50	6.00	55.00

PROSPER, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen- Free Extract.	Ingredients.	Remarks.
1997A	Wheat Mixed Feed.....	Prosper Mill.....	Guarantee	14.50	3.00	10.00	55.00	Wheat bran and shorts.....	
1997B	Corn Chops.....		Guarantee	9.50	3.50	3.00	70.00	.....
1997B	Corn Chops.....		Found.....	9.94	4.30	2.01	70.13	.....

PRYOR, OKLAHOMA.

1249A	Corn Chops.....	Hogan, Hayden & Co.....	Guarantee	9.00	3.00	3.50	70.00	
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PURCELL, OKLAHOMA.

1587A	Corn Chops.....	Archer Grain and Lumber Co	Guarantee	9.54	3.99	2.58	70.98	
659A	Corn Chops.....	J. I. Baker Gin and Mill Co.	Guarantee	9.00	4.00	3.00	70.00	.....
899A	Corn Chops.....	C. C. Hall Grain Co.....	Guarantee	9.00	4.00	3.00	70.00	.....
110A	Corn Chops.....	Purcell Mill and Elevator... Co.	Guarantee	9.00	3.00	3.00	70.00	.....

QUAIL, TEXAS.

323A	Corn Chops.....	T. M. Aaron.....	Guarantee	9.00	4.00	3.00	70.00	.....
1900A	Corn Chops.....	J. M. Depauw.....	Guarantee	9.00	3.50	3.00	70.00	.....

QUANAH, TEXAS.

713A	Cottonseed Meal.....	.....	Guarantee	44.00	7.00	11.00	22.00	.....	Adulterated hulls.
11P	Cottonseed Meal.....		Found.....	47.75	8.47	9.08	25.01	.....
23P	Cottonseed Meal.....		Found.....	41.26	7.08	12.96	26.84	.....
713B	Cottonseed Cake.....	.....	Guarantee	44.00	7.00	11.00	22.00	.....

24P	Cottonseed Cake.	Found....	39.94	7.18	13.76	26.15	Adulterated hulls.
38P	Cottonseed Cake.	Found....	42.10	8.08	12.80	25.32	Adulterated hulls.
47P	Cottonseed Cake.	Found....	40.40	7.07	12.77	27.08	Adulterated hulls.
48P	Cottonseed Cake.	Found....	41.79	7.37	11.07	25.85	Adulterated hulls.
713D	Mixed Feed.	Guarantee	10.50	2.65	41.00	32.00	Cottonseed hulls and meal.
713E	Cottonseed Cake and Hulls	Guarantee	40.00	7.00	12.00	22.00	
86P	Cottonseed Cake and Hulls	Found....	43.63	5.62	14.74	30.40	Adulterated hulls.
90P	Cottonseed Cake and Hulls	Found....	34.66	5.79	14.80	29.97	Adulterated hulls.
713F	Cottonseed Meal and Hulls	Guarantee	40.00	7.00	12.00	22.00	Adulterated hulls.
87P	Cottonseed Meal and Hulls	Found....	35.00	6.49	14.75	29.13	
713G	Cottonseed Meal and Hulls	Found....	35.25	6.10	14.99	31.37	
713G	Cottonseed Meal and Hulls	Guarantee	35.00	6.00	14.00	22.00	
713H	Cottonseed Cake and Hulls	Guarantee	35.00	6.00	14.00	22.00	
713H	Cottonseed Cake and Hulls	Found....	39.13	6.61	12.40	29.25	
191A	Corn Chops.	Guarantee	9.60	3.90	2.50	70.00	
191B	Mixed Feed.	Guarantee	14.00	4.00	6.00	60.00	Wheat bran and kafir.
191C	Wheat Bran.	Guarantee	18.00	3.90	8.25	55.00	
191D	Mixed Bran.	Guarantee	14.50	3.50	8.00	55.00	Wheat and corn bran.
191E	Mixed Feed.	Guarantee	12.00	4.00	10.00	60.00	Wheat bran, milo and corn bran.
191F	Mixed Feed.	Guarantee	12.00	4.00	10.00	60.00	Wheat bran and milo chops.
191G	Mixed Feed.	Guarantee	9.25	3.00	3.00	70.00	Corn and milo chops.
191H	Mixed Feed.	Guarantee	12.25	3.15	7.50	64.00	Wheat bran and milo chops.
191I	Milo Chops.	Guarantee	10.00	2.50	3.00	72.00	
1577A	Milo Head Chops.	Guarantee	9.50	2.50	7.50	62.00	
1577B	Milo Chops.	Guarantee	9.50	2.50	3.00	71.00	
1577C	Corn Chops.	Guarantee	9.00	3.50	3.00	70.00	

QUINLAN, TEXAS.

1361A	Corn Chops.	Guarantee	9.00	3.00	3.50	70.00	
1361B	Milo Chops.	Guarantee	10.00	2.50	3.00	71.00	
1361B	Milo Chops.	Found....	10.14	2.67	2.43	72.76	

RANDLETT, OKLAHOMA.

1657A	Corn Chops.	Guarantee	9.00	3.50	3.00	70.00	
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RAVENNA, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Ex- tract.	Ingredients.	Remarks.
1506A	Corn Chops.....	Doggett & Palmore.....	Guarantee	9.00	3.50	3.00	70.00		

RAYNE, LOUISIANA.

1186A	Pelican Feed.....	Rayne Rice Milling Co.....	Guarantee	10.50	4.00	12.90	53.00	Rice bran, rice polish, corn chops and cottonseed meal.	
1186C	Pelican Dairy Feed.....		Guarantee	15.00	7.00	11.00	49.00	Corn chops, cottonseed meal, rice polish, molasses and rice bran.	
1186D	Rice Bran and Molasses.....		Guarantee	8.00	3.00	15.00	42.00		
1186E	Mixed Feed.....		Guarantee	10.00	8.00	15.00	42.00	Rice bran, rice hulls and molasses.	

REAGAN WELLS, TEXAS.

1800A	Egyptian Wheat.....	I. A. J. Nelson.....	Guarantee	8.00	2.50	7.50	66.00		
1800B	Ear Corn Chops.....		Guarantee	8.00	3.00	10.00	65.00		
1800C	Mixed Feed.....		Guarantee	8.00	2.50	7.50	62.00	Ear corn crushed, milo heads crushed.	
1800C	Mixed Feed.....		Found....	9.31	2.76	7.91	68.13		

REEDS, MISSOURI.

1402B	Corn Chops.....	Reeds Milling Co.....	Guarantee	9.54	3.99	2.58	70.98		
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REPUBLIC, MISSOURI.

1764A	Wheat Shorts.....	Langensberg Milling Co.....	Guarantee	15.50	4.20	5.00	57.00		
1764B	Wheat Bran and Screenings.....		Guarantee	14.50	3.50	10.00	52.00		
1764C	Corn Chops and Corn Bran.....		Guarantee	9.00	3.00	3.00	70.00		
1764D	White Wheat Shorts.....		Guarantee	14.50	3.00	3.50	57.00		
1764E	White Wheat Shorts.....		Found....	17.94	3.80	2.38	63.10		

1764F	Wheat Mixed Feed and Screenings.	Guarantee	16.00	3.50	8.50	57.00	Wheat bran, shorts and screenings.
1764F	Wheat Mixed Feed and Screenings.	Found....	17.19	4.31	8.91	52.66	

RHOME, TEXAS.

12A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	
12B	Mixed Bran and Shorts.....	Guarantee	15.20	4.80	10.00	54.79	Corn and wheat bran and wheat shorts.
12C	Wheat Bran and Shorts.....	Guarantee	16.35	3.65	10.00	50.00	
12D	Milo Chops.....	Guarantee	9.05	2.50	3.00	71.00	
12E	Mixed Bran and Screenings.....	Guarantee	15.20	4.80	10.00	54.79	Wheat bran, corn bran and screenings.
12F	White Wheat Shorts.....	Guarantee	17.00	3.50	4.50	60.00	
12F	White Wheat Shorts.....	Found.....	16.72	2.61	1.44	67.91	

Rhyme Milling Co.....

RICHLAND, TEXAS.

1918A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	
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B. L. Swink.....

RICHMOND, TEXAS.

1855A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	23.00	
21T	Cottonseed Meal.....	Found....	42.63	6.65	11.55	25.38	
23R	Cottonseed Meal.....	Found....	43.25	8.81	10.50	23.27	Adulterated hulls.
341C	Mixed Feed.....	Guarantee	12.48	6.50	10.00	50.00	Wheat bran, rice bran and rice polish.
341D	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	
341E	Corn Bran.....	Guarantee	10.00	8.00	8.00	60.00	
341F	Mixed Chicken Feed.....	Guarantee	10.00	3.00	3.50	65.00	Corn chops, milo, wheat, rice and oats.
341C	Mixed Bran.....	Guarantee	12.00	7.50	8.50	54.00	Wheat, rice and corn bran.

Fort Bend Cotton Oil Co..

Corn Chops.....

Corn Bran.....

Mixed Chicken Feed.....

Mixed Bran.....

Wheat, rice and corn bran.

RISING STAR, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Ex- tract.	Ingredients.	Remarks.
2111A	Corn Chops.	{	{	{	{	{	{	{	{
2111A	Corn Chops.								
2192A	Corn Chops.	{	{	{	{	{	{	{	{
2192A	Corn Chops.								

ROANOKE, TEXAS.

964A	Corn Chops.	{	{	{	{	{	{	{	{
		P. Lassen.	Guarantee	9.00	3.50	3.00	70.00		

ROARING SPRINGS, TEXAS.

2194A	Corn Chops.	{	{	{	{	{	{	{	{
2194A	Corn Chops.								
2194B	Milo Chops.								
2194B	Milo Chops.								

ROBY, TEXAS.

890A	Corn Chops.	{	{	{	{	{	{	{	{
		H. S. Bridges.	Guarantee	9.00	4.00	3.00	70.00		

ROCHESTER, TEXAS.

693A	Corn Chops.	{	{	{	{	{	{	{	{
1962A	Corn Chops.								
1044A	Corn Chops.								

ROCKDALE, TEXAS.

503A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	24.00	
35B	Cottonseed Meal.....	Found....	43.38	8.78	9.35	26.64	
503B	Cottonseed Meal and Hulls	Guarantee	43.00	7.00	12.00	23.00	
503B	Cottonseed Meal and Hulls	Found....	45.91	8.08	9.00	23.75	
1976A	Mixed Feed.....	Guarantee	11.00	5.25	7.00	59.00	Cane seed, rice bran, rice polish and wheat bran.

ROCKPORT, TEXAS.

2035A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	
2035A	Corn Chops.....	Found....	10.63	4.10	2.49	70.49	

ROCKWALL, TEXAS.

623A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	20.00	
57Y	Cottonseed Meal.....	Found....	44.32	7.06	10.27	26.22	
623B	Mule Feed.....	Guarantee	11.00	2.75	35.00	37.00	Cottonseed hulls and meal and corn meal.
623C	Mixed Feed.....	Guarantee	10.60	2.85	39.00	32.00	Cottonseed hulls and meal.
623D	Cow Feed.....	Guarantee	10.30	3.50	36.60	38.30	Cottonseed hulls and meal.
623E	Corn Meal.....	Guarantee	8.00	3.00	3.00	70.00	
625F	Cottonseed Meal and Hulls	Guarantee	43.00	7.00	12.00	23.00	
623F	Cottonseed Meal and Hulls	Found....	42.31	6.99	11.15	26.60	
830A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	
1099	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	
615A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	

ROFF, OKLAHOMA.

2183A	Mixed Feed.....	Guarantee	22.00	5.00	30.00	41.00	Cottonseed meal and hulls.
2183A	Mixed Feed.....	Found....	23.06	5.34	22.04	36.61	
2183C	Mixed Feed.....	Guarantee	10.30	1.80	34.00	42.00	Cottonseed hulls and meal.
2183C	Mixed Feed.....	Found....	9.30	1.68	32.60	45.15	

ROFF, OKLAHOMA—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Extract.	Ingredients.	Remarks.
1089A	Corn Chops.....	Hutchenson Grain and Elevator Co.	Guarantee	9.00	3.50	3.00	70.00	.....	.....
1114A	Corn Chops.....	Roff Grain Co.....	Guarantee	9.00	3.50	3.00	70.00	.....	.....

ROGERS, TEXAS.

1860A	Cottonseed Meal.....	Farmers Cotton Oil Co.....	Guarantee	44.00	7.00	8.61	22.00	.....	.....
2180A	Rogola Cow Feed.....	Rogers Produce Co.....	Guarantee	18.50	3.80	6.44	55.00	Cottonseed meal, milo chops and wheat mixed feed.	.....
2180A	Rogola Cow Feed.....		Found.....	21.10	4.36	6.01	54.40	.....	.....

ROGERS, ARKANSAS.

1368A	Corn Chops.....	Rogers Milling Co.....	Guarantee	9.00	3.00	3.50	70.00	.....	.....
1368B	Wheat Mixed Feed.....		Guarantee	14.50	4.00	10.00	55.00	Wheat bran and shorts.	.....
1368C	Mixed Feed.....		Guarantee	14.50	4.00	10.00	55.00	Wheat bran, shorts and screenings.	.....

ROSEBUD, TEXAS.

1059A	Corn Chops.....	George W. Lehman.....	Guarantee	9.00	3.50	3.00	70.00	.....	.....
1059B	Kafir Chops.....		Guarantee	9.50	2.75	3.00	71.00	.....	.....
1059C	Mixed Chops.....		Guarantee	9.25	3.15	3.00	70.50	Corn and kafir chops.	.....
1023A	Corn Chops.....	McCarty Shivers Grain Co.....	Guarantee	9.00	3.50	3.00	70.00	.....	.....
226A	Cottonseed Meal.....	Rosebud Oil and Cotton Co.	Guarantee	44.00	7.00	11.00	20.00	.....	.....
37B	Cottonseed Meal.....		Found.....	44.50	6.32	10.71	24.92	.....	.....
226B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	20.00	.....	.....
226C	Cottonseed Meal and Hulls		Guarantee	34.44	7.11	16.19	28.07	.....	.....
226C	Cottonseed Meal and Hulls	.....	Found.....	38.41	6.13	17.02	20.24	.....	.....

ROSENBERG, TEXAS.

1870A	Chicken Feed.....	Meyer & Bailey.....	Guarantee	9.00	3.00	3.50	70.00	Corn chops, milo, wheat and rice...
1323A	Corn Chops.....	Rosenberg Mill and Elevator Co.	Guarantee	9.54	3.99	2.58	70.98	.....
1323B	Cream Dairy Feed.....		Guarantee	16.08	5.43	17.02	45.26	Corn-chops, rice bran, cottonseed and alfalfa meal.
1323C	Corn and Kafir Chops.....		Guarantee	9.00	3.00	2.58	70.98	.....
1323D	R. Cream Dairy Feed.....		Guarantee	16.03	5.45	17.02	45.28	Corn and kafir chops, rice bran, cottonseed and alfalfa meal.
1323E	Hellen's Chick Feed with Oyster Shell.....		Guarantee	7.23	2.53	3.62	54.28	Corn, corn chops, wheat, millet, bone meal, oyster shell, kafir and crushed rice.
1323F	Rosenberg Fat Stock Feed.....		Guarantee	15.00	4.00	16.87	51.06	Corn bran, corn chops, kafir chops, cottonseed and alfalfa meal.
1323G	Corn Bran.....		Guarantee	8.49	3.00	8.00	65.26	.....
2059A	Corn Chops.....		Guarantee	9.00	3.50	2.80	69.00	.....
2059A	Corn Chops.....		Found.....	10.97	4.90	2.54	69.57	.....
2059B	Corn Feed Meal.....		Guarantee	9.00	3.50	2.80	69.00	.....
2059B	Corn Feed Meal.....	Wisdom Grain Co.....	Found.....	9.63	4.00	2.59	72.07	.....
2059C	Ground Oats.....		Guarantee	11.00	3.50	12.00	57.00	.....
2059C	Ground Oats.....		Found.....	13.75	3.63	10.74	57.71	.....
2059D	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50	.....
2059D	Milo Chops.....		Found.....	11.21	2.73	2.48	69.90	.....

ROSSELL, NEW MEXICO.

896A	Alfalfa Meal.....	Roswell Wool and Hides Co.	Guarantee	12.00	1.00	30.00	30.00	.....
896B	Lucerno Stock Food.....		Guarantee	15.00	3.00	33.00	30.00	Milo, alfalfa and cottonseed meal.

ROSPRIM, TEXAS.

460A	Corn Chops.....	George Echols.....	Guarantee	9.00	4.00	3.00	70.00
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ROUND ROCK, TEXAS.

1680A	Corn Chops.....	J. E. Palm.....	Guarantee	9.00	3.50	3.00	70.00
1621A	Corn Chops.....	L. Robertson.....	Guarantee	9.00	3.50	3.00	70.00

BOWENA, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Extract.	Ingredients.	Remarks.
1955A	Milo and Feterita Chops...	M. Feist.....	Guarantee	9.50	2.25	2.50	65.00		
1955B	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.00		

ROXTON, TEXAS.

512A	Cottonseed Meal.....	Roxton Cotton Oil Co.....	Guarantee	44.00	7.00	11.00	24.00		Adulterated hulls.
64Y	Cottonseed Meal.....		Found....	41.84	7.21	11.34	26.03		
512B	Cottonseed Meal and Hulls		Guarantee	43.00	7.00	12.00	23.00		
512B	Cottonseed Meal and Hulls		Found....	39.82	8.96	11.63	27.56		

ROYSE CITY, TEXAS.

1759A	Corn Chops.....	City Mill and Light Co...	Guarantee	9.00	3.50	3.00	70.00		
1759B	Wheat Bran.....		Guarantee	14.50	3.50	10.00	55.00		
1759B	Wheat Bran.....		Found....	19.91	4.39	8.24	52.85		
1759C	Mixed Bran.....		Guarantee	14.00	3.50	9.00	54.00		Wheat and corn bran.
1759C	Mixed Bran.....	Wheat Short.	Found....	18.72	4.87	8.75	52.11		
1759D	Wheat Short.		Guarantee	17.00	3.80	4.50	60.00		
1759D	Wheat Short.		Found....	18.77	3.79	2.13	61.40		
69A	Corn Chops.....	Pennington Brothers.....	Guarantee	9.60	3.90	2.52	71.71		
73A	Choice Cottonseed Meal....	Royse Cotton Oil Co.....	Guarantee	48.00	7.00	9.00	22.00		
73B	Cottonseed Cake.....		Guarantee	44.00	8.00	11.00	22.00		
73C	Cottonseed Meal.....		Guarantee	44.00	8.00	11.00	22.00		
58Y	Cottonseed Meal.....		Found....	47.35	8.00	9.38	21.96		

RUEDOSIA, TEXAS.

2080A	Wheat Bran.....	Carlos Montemayor.....	Guarantee	15.00	3.50	9.00	54.00		
2080A	Wheat Bran.....		Found....	16.00	3.06	9.41	58.27		

RULE, TEXAS.

702A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	24.00	
702B	Cottonseed Cake.....	Guarantee	44.00	7.00	11.00	24.00	
702E	Ruco Mixed Feed No. 1....	Guarantee	11.00	3.00	40.00	32.00	Cottonseed hulls and meal.
38W	Ruco Mixed Feed No. 1....	Found....	12.13	3.51	38.67	33.06	
702F	Cottonseed Cake.....	Guarantee	45.00	7.00	8.00	24.00	
702G	Ruco Mixed Feed No. 2....	Guarantee	9.80	2.50	40.00	30.00	Cottonseed hulls and meal.
702H	Ruco Mixed Feed No. 3....	Guarantee	10.60	2.80	40.00	30.00	Cottonseed hulls and meal.
702I	Cottonseed Meal.....	Guarantee	45.00	7.00	8.00	24.00	
702J	Cottonseed Cake and Hulls	Guarantee	39.00	6.00	15.00	23.00	
702J	Cottonseed Cake and Hulls	Found....	38.87	5.41	14.71	26.28	
39W	Cottonseed Cake and Hulls	Found....	36.88	5.95	16.32	27.67	
702K	Cottonseed Meal and Hulls	Guarantee	39.00	6.00	15.00	23.00	
702K	Cottonseed Meal and Hulls	Found....	37.52	8.08	14.20	26.92	
78P	Cottonseed Meal and Hulls	Found....	37.44	9.85	14.89	26.75	

Excess hulls.

RUNGE, TEXAS.

1789A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	
786A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	
786B	Corn and Cob Meal.....	Guarantee	8.50	3.50	6.00	65.00	

RUNNING WATER, TEXAS.

1231A	Kafir Head Chops.....	Guarantee	9.00	2.50	10.00	60.00	
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RYAN, OKLAHOMA.

920A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	25.00	
920B	Cottonseed Cake.....	Guarantee	44.00	7.00	11.00	25.00	
836A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	
1750A	Corn Chops.....	Guarantee	9.45	3.99	3.00	70.98	

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen.	Ingredients.	Remarks.
1806A	Corn Chops.	Reinemer & Penick.	Guarantee	9.00	3.50	3.00	70.00		
1806A	Corn Chops.		Found....	11.80	4.32	2.51	71.33		
1806B	Milo Chops.		Guarantee	10.00	2.75	3.00	68.00		
1906B	Milo Chops.		Found....	11.59	2.93	2.79	72.84		
SAINT JO, TEXAS.									
542A	Corn Chops.	D. C. Dairy.	Guarantee	9.00	4.00	3.00	70.00		
SAINT JOHN, KANSAS.									
1369A	Wheat Bran.	St. John Mill and Power Co.	Guarantee	14.28	3.85	9.50	53.93		
1369B	Wheat Shorts.		Guarantee	16.11	4.58	5.96	57.19		
1369C	Corn Chops.		Guarantee	9.00	3.00	3.50	70.00		
SAINT JOSEPH, MISSOURI.									
141A	Corn Chops.	Aunt Jenima Mills Co. . . .	Guarantee	9.00	3.25	3.50	70.00		
141B	Wheat Bran and Screenings		Guarantee	14.50	3.50	11.00	50.00		
141C	Wheat Shorts.		Guarantee	16.00	3.50	6.00	60.00		
141B	Wheat Mixed Feed and Screenings.		Guarantee	16.50	3.50	10.00	52.00	Wheat bran, shorts and screenings.	
11152A	Homco Feed.	American Hominy Co.	Guarantee	9.50	5.00	3.50	65.00	Hominy feed.	
1061A	Corn Chops.	Burke Grain Co.	Guarantee	9.00	4.00	3.00	70.00		
726A	Corn Chops.	Elwood Grain Co.	Guarantee	9.00	4.00	3.00	70.00		
1496A	Excallo Mule and Horse Feed.		Guarantee	11.51	4.10	10.15	58.41	Linseed and alfalfa meal, flaked oats, corn and molasses.	

1496B	Excello Molasses Feed.....	Excello Feed Milling Co....	8.50	.75	20.00	48.00	Alfalfa meal and molasses
1496C	Excello Molasses Feed.....		10.00	1.00	25.00	39.10	Alfalfa hay and molasses
1496D	Excello Horse Feed.....		10.00	3.00	15.00	58.41	Alfalfa and linseed meal, corn chops and crushed oats molasses and salt.
1278A	Corn Chops.....	St. Joseph Hay and Feed Co.	9.00	3.00	3.50	70.00	

SAINT JOHN, KANSAS.

1740A	Wheat Bran.....	St. John Mills.....	15.50	4.00	8.50	53.00	
1740B	Wheat Mixed Feed.....		17.06	5.80	9.57	52.41	Wheat bran and shorts.

SAINT LOUIS, MISSOURI.

1602B	Jersey Sugar Feed.....	Allneeda Mills Co.....	10.40	1.80	27.60	56.00	Alfalfa meal and molasses
1602C	Dexter Horse and Mule Feed.....		11.90	3.50	11.70	52.37	Corn screening, oat screenings, oats, salt, alfalfa meal and molasses
1602D	Butter Fat Dairy Feed.....		16.95	3.50	10.62	51.70	Alfalfa, corn and cottonseed meal, ground screenings, wheat bran and molasses
1602E	Allneeda Horse and Mule Feed.....		11.50	3.51	10.96	53.06	Corn, alfalfa, oats, molasses and salt.
1602G	Allneeda Hen Feed.....		10.41	3.28	3.24	70.62	Corn, wheat, kafir and sunflower seed.
1408A	Chicken Feed.....		10.00	3.50	6.00	60.00	Corn, kafir, milo, screenings and wheat
1408D	Acorn Chick Feed.....	F. B. Chamberlain Co.....	10.00	3.50	6.00	60.00	Corn, kafir, milo, screenings and wheat
1408E	Acorn Hen Feed.....		10.00	3.50	6.00	60.00	Corn, wheat, kafir, milo, barley, oats, grain screenings, miscellaneous seeds and sunflower seed.
1408G	O. U. Hen Feed.....		9.00	2.50	6.00	60.00	Corn, wheat, kafir, milo, chops, grain screenings, miscellaneous seeds, oat meal, meat and bone, grit and charcoal.
1408F	Perfect Chick Feed with Grit.....		9.00	2.50	6.00	60.00	

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Free Extract.	Ingredients.	Remarks.
1408F	Perfect Chick Feed with Grit.	F. B. Chamberlain Co.— Continued.	Found . . .	13.99	3.35	4.31	62.62	.....
1408H	Premium Hen Feed		Guarantee	10.00	3.50	6.00	60.00	Corn, wheat, kafir, milo, barley, oats chopped, sunflower seed and grain screenings.	
1408I	Premium Hen Feed		Found . . .	11.28	2.99	2.78	69.25	.....
1408I	Perfect Pigeon Feed		Guarantee	10.00	3.50	6.00	60.00	Kafir, milo, wheat, corn, millet seed, Canadian peas, hemp seed, and buckwheat chopped.	
1408I	Perfect Pigeon Feed		Found . . .	12.88	3.08	4.22	65.70	.....
1408J	Premium Chick Feed		Guarantee	10.00	3.50	6.00	60.00	Corn, kafir, milo chopped, wheat, grain screenings and miscellaneous seeds.	
1408K	Dinner Bell Egg Mash with Charcoal.		Guarantee	10.00	3.50	7.00	65.00	Corn meal, wheat bran, middlings, alfalfa meal, meat and bone, lin- seed meal and charcoal.	
1408K	Dinner Bell Egg Mash with Charcoal.		Found . . .	11.75	2.99	6.98	62.78	.....
1408L	Perfect Hen Feed with Char- coal.		Guarantee	11.00	3.50	4.00	65.00	Corn, wheat, milo, kafir chopped, meat scraps, rolled oats, sun- flower and buckwheat seeds and charcoal.	
1408L	Perfect Hen Feed with Char- coal.		Found . . .	12.31	4.10	3.34	64.45	.....
1288A	Action Horse Feed	Commonwealth Feed Mill Co.	Guarantee	11.00	3.00	17.50	47.00	Alfalfa, corn, oats, ground peanuts and hulls and salt.	
1288B	Wheel Horse Feed		Guarantee	11.00	3.00	17.50	47.00	Alfalfa, corn, oats, ground peanuts and hulls and salt.	

732A	Corno Horse and Mule Feed	Guarantee	10.00	3.50	12.00	58.50	Ground corn, cottonseed meal, oat middlings and hulls, ground alfalfa and hominy feed.
732B	Corno Hen Feed	Guarantee	10.00	3.50	5.00	68.00	Wheat, corn, kafir, milo and sunflower seed.
732D	Cremo Dairy Feed	Guarantee	15.00	3.25	23.50	44.00	Ground alfalfa, cottonseed meal, flax bran, hominy feed, oat middlings and hulls.
732F	Nutro Hen Feed	Guarantee	10.00	3.50	5.00	68.00	Wheat, barley, oats, corn and kafir.
732G	Pawnee Cow Feed	Guarantee	15.00	5.00	14.00	55.00	Hominy feed, cottonseed meal, ground and re-cleaned wheat and grain screenings and oat hulls.
732H	Molasco Mixed Feed	Guarantee	8.50	2.50	12.00	60.00	Ground alfalfa, cracked corn, oat hulls, molasses, ground, re-cleaned wheat and grain screenings and cottonseed meal.
732I	Corno Dairy Feed	Guarantee	15.00	6.00	14.00	55.00	Ground alfalfa, cottonseed meal, molasses, re-cleaned, ground and wheat screenings and oat hulls.
732J	Corno Mixed Sweet Feed	Guarantee	10.00	2.50	15.00	55.00	Oats, cracked corn, ground alfalfa, molasses, cottonseed meal and oat hulls.
732K	Corno Chick Feed	Guarantee	10.75	2.75	3.00	68.00	Wheat, corn, kafir, millet seed, and re-cleaned wheat screenings.
732L	Alasco Mixed Feed	Guarantee	10.00	1.00	20.00	50.00	Ground alfalfa, and cane molasses.
732M	Corno Horse and Mule Mixed Feed.	Guarantee	10.00	3.50	15.00	58.50	Ground alfalfa, cracked, hominy feed, oat feed (composed of oat middlings, oat shorts and oat hulls)
732M	Corno Horse and Mule Mixed Feed.	Found	10.94	3.26	11.04	58.66	
732N	Nutro Sweet Horse Mixed Feed.	Guarantee	9.00	2.50	15.00	55.00	Ground alfalfa, cracked corn, ground cottonseed hulls, molasses, ground wheat screenings, oat feed (composed of oat middlings, oat shorts and oat hulls).
732N	Nutro Sweet Horse Mixed Feed.	Found	10.13	2.55	14.93	55.72	

Corno Mills

SAINT LOUIS, MISSOURI—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen Extrac.	Ingredients.	Remarks.
1827A	Dixie Horse and Mule Feed.....	Dixie Mills Co.....	Guarantee	10.00	2.50	12.00	50.00	Ground alfalfa, corn, oats, cottonseed and molasses.	
1801A	Alfalfa Molasses Feed.....	{ Golden Grain Milling Co.	Guarantee	11.00	1.00	25.00	48.00	Alfalfa meal, molasses and salt.....	
1801B	Puritan Horse and Mule Feed.		Guarantee	9.00	1.50	14.00	55.00	Cracked corn, oats, alfalfa meal and molasses.	
1801C	Golden Grain Horse and Mule Feed.		Guarantee	10.00	2.00	12.00	55.00	Cracked corn, oats, alfalfa meal, molasses and salt.	
1801D	Ben Hur Horse and Mule Feed.		Guarantee	10.00	2.00	12.00	55.00	Cracked corn, oats, alfalfa meal, molasses and salt.	
1801E	Golden Grain Dairy Feed..		Guarantee	16.50	3.50	12.00	55.00	Oat clipping, reground grain screenings, cottonseed meal, molasses and salt.	
1801F	Golden Grain Chick Feed..	{ Golden Grain Milling Co.	Guarantee	10.00	3.00	5.00	60.00	Wheat, corn, kafir, milo cracked, and millet.	
1801F	Golden Grain Chick Feed..		Found.....	10.38	2.47	3.22	69.01	.....
1801G	Golden Grain Scratch Feed		Guarantee	10.00	3.00	6.00	60.00	Cracked corn, wheat, barley, kafir, milo and sunflower seed.	
1801G	Golden Grain Scratch Feed		Found.....	10.50	2.84	3.21	72.16	.....
1801H	Economy Scratch Feed.....		Guarantee	10.00	3.00	6.00	60.00	Cracked corn, wheat, barley, kafir, and milo.	
1801H	Economy Scratch Feed.....	{ Harsh Brothers & Co.....	Found.....	9.81	3.03	3.11	71.00	.....
1538A	Corn Chops.....		Guarantee	9.00	3.50	3.50	70.00	.....
1217A	Wheat Bran.....		Guarantee	14.50	4.00	9.50	55.00	.....
1217B	Wheat Mixed Feed and Ground Screenings.		Guarantee	14.50	4.00	9.50	55.00	Wheat bran, shorts and screenings..	
1217C	Wheat Shorts.....		Guarantee	15.00	3.00	5.00	55.00	.....

1203A	Wheat Mixed Feed and Screenings.	National Feed Co.	4.00	10.00	55.00	Wheat bran, shorts and screenings...
1203B	Wheat Bran and Screenings		14.50	4.00	10.00	
1203C	Wheat Middlings and Ground Screenings.		16.00	4.00	9.00	
2071A	Wheat Bran.....	George P. Plant Milling Co.	14.50	3.00	10.00	
2071B	Wheat Bran.....	Found....	15.81	4.10	10.58	
2071B	Wheat Shorts.....	Guarantee	15.00	3.50	5.00	
2071B	Wheat Shorts.....	Found....	18.93	5.08	5.81	
346E	Purina Feed with Molasses.	Guarantee	9.30	1.70	11.70	Cracked corn, unground oats, molasses, salt and ground alfalfa hay.
346F	Purina Dairy Feed.....	Guarantee	20.00	3.80	15.00	Cottonseed and corn feed meal, brewers' dried grain, molasses, salt and ground alfalfa hay.
140Y	Purina Dairy Feed.....	Found....	23.35	3.68	16.66	
346G	Protina Dairy Feed.....	Guarantee	16.50	3.50	12.00	Cottonseed meal, brewers' dried grain, molasses, salt, ground wheat screenings and clipped oat by-product (composed of oat hulls, immature oats, dust and chaff).
346G	Protina Dairy Feed.....	Found....	15.67	5.18	14.99	
346I	Purina Chick Feed.....	Guarantee	11.00	3.00	4.00	Wheat, corn, millet, kafir, milo, cracked.
136Y	Purina Chick Feed.....	Found....	10.93	2.84	2.47	
346J	Purina Scratch Feed.....	Guarantee	11.00	3.00	4.00	Wheat, corn, barley, kafir, milo and sunflower seed.
138Y	Purina Scratch Feed.....	Found....	9.99	3.81	3.65	
346K	Purina Pigeon Food.....	Guarantee	11.00	3.00	4.00	Wheat, corn, millet, kafir, milo and peas.
346L	Purina Chicken Chowder Feed with Charcoal.....	Guarantee	17.00	3.00	9.00	Wheat middlings, wheat bran, corn and linseed meal, ground alfalfa hay, granulated meat, salt and charcoal.
139Y	Purina Chicken Chowder Feed with Charcoal.....	Found....	18.35	4.17	8.70	
346N	Goodluck Feed with Molasses.	Guarantee	9.00	1.50	12.00	Cracked corn, unground oats, salt and ground alfalfa hay.

SAINT LOUIS, MISSOURI—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Extract.	Ingredients.	Remarks.
3460	O. K. Feed with Molasses.	Ralston Purina Co.	Guarantee	9.00	1.50	12.00	59.00	Cracked corn, oats, molasses, salt and ground alfalfa.	
346P	XX Good Feed with Molasses.		Guarantee	9.00	1.50	12.00	59.00	Cracked corn, oats, molasses, salt and ground alfalfa.	
1508A	Wheat Shorts	Regina Flour Mill Co.	Guarantee	16.95	5.48	3.97	58.14		
1508B	Wheat Bran.		Guarantee	14.80	3.97	9.00	52.83		
1521A	Winner Molasses Feed.	Robinson-Danforth Co.	Guarantee	9.00	1.50	12.50	57.00	Cracked corn, oats, molasses and ground alfalfa.	
287B	No. 1 Brown Wheat Middling.	Saxony Mills.	Guarantee	15.00	4.00	8.00	55.00		
287C	Corn Chops.		Guarantee	9.00	3.50	3.50	70.00		
287D	Wheat Bran and Screenings	Stanard-Tilton Milling Co.	Guarantee	14.50	3.00	10.00	52.00		
985A	Wheat Bran and Screenings		Guarantee	14.50	4.00	9.50	54.00		
985A	Wheat Bran and Screenings		Found.	17.24	3.85	9.75	51.01		
985B	Wheat Middlings and Screenings.		Guarantee	15.00	4.00	6.00	40.00		
985B	Wheat Middlings and Screenings.		Found.	17.74	4.56	5.77	57.42		

SAINT MARYS, MISSOURI.

692A	Wheat Bran	St. Marys Mill Co.	Guarantee	15.06	3.06	8.93	54.70		
692C	Wheat Middlings		Guarantee	16.50	3.50	5.00	60.00		
660A	Corn Chops.	Bulzer Brothers	Guarantee	9.00	3.00	3.50	70.00		

SAGERTON, TEXAS.

SALADO, TEXAS.

400A	Wheat Bran	Guarantee	15.08	4.08	8.10	52.05
400B	Corn Chops	Guarantee	9.00	4.00	3.00	70.00
400C	Corn Bran	Guarantee	8.00	4.00	9.00	60.00
400D	Chopped Wheat	Guarantee	12.00	2.00	2.00	71.00

SALINA, KANSAS.

2193A	Wheat Bran and Screenings	Guarantee	14.50	3.50	10.00	54.00
2193A	Wheat Bran and Screenings	Found	16.44	4.03	8.92	53.62
2193B	Wheat Shorts	Guarantee	16.00	3.50	5.00	56.00
2193B	Wheat Shorts	Found	18.43	4.43	6.00	56.15
2193C	Wheat Mixed Feed and Screenings	Guarantee	16.00	3.50	8.50	55.00
2193C	Wheat Mixed Feed and Screenings	Found	17.41	4.10	8.58	53.62
2172A	Wheat Bran and Screenings	Guarantee	15.00	3.00	10.00	55.00
2172A	Wheat Bran and Screenings	Found	17.50	3.64	8.88	51.83
2172B	Wheat Shorts	Guarantee	15.00	3.50	5.00	60.00
2172B	Wheat Shorts	Found	16.41	3.26	4.09	62.02

Adul. wheat bran.

Wheat bran, shorts and screenings.

SALT LAKE CITY, UTAH.

1500A	Wheat Mixed Feed	Guarantee	15.00	3.75	9.00	55.00
1500B	Wheat Mixed Feed and Screenings	Guarantee	15.00	3.75	9.00	55.00

Wheat bran and shorts.

Wheat bran, shorts and screenings.

SAN ANGELO, TEXAS.

1095A	Corn Chops	Guarantee	9.00	3.50	3.00	70.00
1095B	Milo Head Chops	Guarantee	9.50	2.50	7.50	62.00
1095C	Kafir Head Chops	Guarantee	9.00	2.50	7.00	68.00
1095D	Wheat Bran, Shorts and Screenings	Guarantee	16.00	3.50	8.00	55.00
1095E	Milo Chops	Guarantee	10.00	2.50	3.00	70.00
1095F	Corn Bran	Guarantee	9.00	5.00	10.00	63.00
1095F	Corn Bran	Found	12.22	6.93	5.29	64.37

SAN ANGELO, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	%Fat.	Crude Fiber.	Nitro- gen- Ex- tract.	Ingredients.	Remarks.
1517A	Milo Head Chops.	Mason Brothers.	Guarantee	9.50	2.50	7.50	62.00		
1517B	Corn Chops.		Guarantee	9.00	3.50	3.00	70.00		
843A	Cottonseed Meal.	San Angelo Cotton Oil Co.	Guarantee	44.00	7.00	11.00	23.00		
50W	Cottonseed Meal.		Found....	44.54	6.99	11.26	25.30		
843B	Cottonseed Cake.		Guarantee	44.00	7.00	11.00	22.00		
49W	Cottonseed Cake.		Found....	46.88	6.12	9.20	24.84		
843E	Angelo Mixed Feed.		Guarantee	9.50	1.25	44.50	27.00	Cottonseed hulls and meal.	
51W	Angelo Mixed Feed.		Found....	10.68	2.35	42.89	32.24		
1858A	Mixed Chicken Feed.	Young & Bennett.	Guarantee	9.50	2.50	3.00	70.00	Milo, wheat, and corn chops.	
606A	Cottonseed Meal.	Alamo Oil and Refining Co.	Guarantee	44.00	7.00	11.00	22.00		
11T	Cottonseed Meal.		Found....	47.65	7.72	7.68	24.58		
606B	Cottonseed Cake.		Guarantee	44.00	7.00	11.00	22.00		
606C	A Mixed Feed.		Guarantee	9.00	3.00	50.00	20.00	Cottonseed hulls and meal.	
1867A	Laying Mash with Charcoal		Guarantee	15.00	4.50	9.00	50.00	Wheat bran, shorts, corn meal, brewers' grain, beef scraps, linseed meal and charcoal.	
1867B	Poultry Mash with Charcoal		Guarantee	20.00	4.50	18.00	45.00	Alfalfa, corn and linseed meal, brewers' grain, wheat bran, wheat shorts, beef scraps and charcoal.	
97T	Poultry Mash with Charcoal		Found....	21.87	5.18	10.49	46.81		
1867C	Maltine Mixed Feed.		Guarantee	20.00	5.00	15.00	42.00	Brewers' grain, wheat bran and cottonseed meal, unbolted corn meal.	
64T	Maltine Mixed Feed.		Found....	22.78	5.72	12.32	46.58		
1867D	Corn Chops.		Guarantee	9.50	3.50	3.00	70.00		
62T	Poultry Mash with Charcoal		Found....	23.74	5.40	11.92	44.44		

SAN ANTONIO, TEXAS.

606A	Cottonseed Meal.	Alamo Oil and Refining Co.	Guarantee	44.00	7.00	11.00	22.00		
11T	Cottonseed Meal.		Found....	47.65	7.72	7.68	24.58		
606B	Cottonseed Cake.		Guarantee	44.00	7.00	11.00	22.00		
606C	A Mixed Feed.		Guarantee	9.00	3.00	50.00	20.00	Cottonseed hulls and meal.	
1867A	Laying Mash with Charcoal		Guarantee	15.00	4.50	9.00	50.00	Wheat bran, shorts, corn meal, brewers' grain, beef scraps, linseed meal and charcoal.	
1867B	Poultry Mash with Charcoal		Guarantee	20.00	4.50	18.00	45.00	Alfalfa, corn and linseed meal, brewers' grain, wheat bran, wheat shorts, beef scraps and charcoal.	
97T	Poultry Mash with Charcoal		Found....	21.87	5.18	10.49	46.81		
1867C	Maltine Mixed Feed.		Guarantee	20.00	5.00	15.00	42.00	Brewers' grain, wheat bran and cottonseed meal, unbolted corn meal.	
64T	Maltine Mixed Feed.		Found....	22.78	5.72	12.32	46.58		
1867D	Corn Chops.		Guarantee	9.50	3.50	3.00	70.00		
62T	Poultry Mash with Charcoal		Found....	23.74	5.40	11.92	44.44		

1867B	Poultry Mash with Charcoal	Found....	23.19	5.40	11.59	45.37	.....
1867C	Maltine Mixed Feed.	Found....	25.41	5.72	11.39	46.55	.....
1867D	Corn Chops.	Found....	10.00	3.96	2.59	70.95	.....
98T	Maltine Mixed Feed.	Found....	21.88	5.72	14.07	45.39	.....
1867E	Startrite Chick Feed.	Guarantee	11.00	2.25	3.50	69.00	Wheat ground, milo, feterita and millet.
1867E	Startrite Chick Feed.	Found....	11.94	2.90	4.13	69.80	.....
122T	Startrite Chick Feed.	Found....	11.94	2.43	3.03	71.14	.....
1867F	Scratch Feed.	Guarantee	11.00	2.50	3.50	68.00	Corn chops, wheat, milo and feterita.
1867F	Scratch Feed.	Found....	12.13	2.88	2.82	69.64	.....
1867G	Dandee Chick Feed.	Guarantee	11.25	2.25	3.25	70.00	Wheat, milo, feterita, millet seed ground.
1867G	Dandee Chick Feed.	Found....	11.60	2.35	3.02	71.93	.....
1867H	Dandee Scratch Feed.	Guarantee	11.00	3.00	3.50	69.00	Corn chops, wheat, milo, feterita and sunflower seed.
1867H	Dandee Scratch Feed.	Found....	11.22	3.13	2.29	71.71	.....
1867I	Dasy Scratch Feed.	Guarantee	11.00	3.00	3.50	69.00	Corn chops, milo, wheat and feterita.
1867I	Dasy Scratch Feed.	Found....	11.19	3.00	2.43	71.77	.....
1867J	Dried Brewers' Grain.	Guarantee	24.00	6.00	18.00	40.00	.....
1867J	Dried Brewers' Grain.	Found....	26.69	5.24	15.66	42.07	.....
1867K	Dandee Developing Chicken Feed.	Guarantee	11.00	2.50	3.50	69.00	Corn chops, milo, wheat, feterita and kafir.
1867K	Dandee Developing Chicken Feed.	Found....	11.09	2.67	2.17	72.79	.....
1867L	Dandee Egg Food and Chowder.	Guarantee	21.00	3.50	7.50	30.00	Cottonseed, linseed, alfalfa and unbolted corn meal, beef scraps, charcoal, wheat bran and shorts, salt, chilli pepper and oyster shell meal.
1867L	Dandee Egg Food and Chowder.	Found....	22.55	5.49	7.93	48.28	.....
1867M	Dandee Growing Developing Mash.	Guarantee	17.00	3.50	7.00	52.00	Wheat bran, alfalfa, cottonseed, and unbolted corn meal, ground milo, wheat and kafir, beef scraps and salt.
1285A	Corn Chops.	Guarantee	9.00	3.00	3.50	70.00	.....
1285B	Maltine Mixed Feed.	Guarantee	20.00	5.00	15.00	42.00	Brewers' grain, wheat bran, cottonseed and unbolted corn meal.

Dandee Feed and Milling

Fest and Trawler.

SAN ANTONIO, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Extr.	Ingredients.	Remarks.
1A	Corn Chops.....	Guenther Milling Co.....	Guarantee	9.00	4.00	3.00	70.00	.....
1B	Wheat Bran.....		Guarantee	14.50	3.50	10.00	52.00	.....
1C	Corn Bran.....		Guarantee	5.00	3.50	12.00	55.00	.....
1D	Mixed Feed.....		Guarantee	14.00	3.50	10.00	50.00	Corn and wheat bran.	
1E	Wheat Shorts.....		Guarantee	16.87	3.48	4.18	61.21	.....
1F	Wheat and Corn Bran.....		Guarantee	14.00	3.50	10.00	50.00	.....
1G	Corn Chops and Corn Bran.....		Guarantee	9.00	3.50	3.50	70.50	.....
1H	Wheat Bran and Screenings.....		Guarantee	14.50	3.50	10.00	52.00	.....
77T	Wheat Bran and Screenings.....		Found....	16.85	4.13	8.85	51.94	.....
1I	Milo Chops.....		Guarantee	10.00	2.50	3.00	71.00	.....
1I	Milo Chops.....		Found....	12.60	2.95	2.46	67.31	.....
1145A	Dried Brewers' Grain.....	Lone Star Brewing Co.....	Guarantee	20.00	6.00	20.00	42.00	.....
94T	Dried Brewers' Grain.....		Found....	20.63	6.02	18.16	42.91	.....
1706A	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....	Adul. corn bran.
92B	Corn Chops.....	M. Maruchau Grain Co..	Found....	10.03	4.92	3.96	69.37	.....	Contains some
119T	Corn Chops.....		Found....	9.21	4.14	2.94	69.31	.....	damaged corn.
1706B	Milo Chops.....		Guarantee	10.00	2.50	3.00	71.00	.....
1706B	Milo Chops.....		Found....	10.94	2.93	2.68	70.72	.....
1706C	Mixed Chops.....		Guarantee	9.50	3.00	3.00	70.00	Corn and milo chops	
1706C	Mixed Chops.....		Found....	9.88	3.98	2.53	71.16	.....
1706D	Brewers' Dried Grain.....		Guarantee	22.00	6.00	15.00	43.00	.....
1706D	Brewers' Dried Grain.....		Found....	24.52	7.64	14.25	43.50	.....
2106A	Corn Chops.....	B. Martinez & Son.....	Guarantee	9.50	3.50	3.00	70.00	.....
2106A	Corn Chops.....		Found....	10.69	4.14	2.39	70.03	.....
1349A	Alfalfa Meal.....	J. F. Muggs & Co.....	Guarantee	15.50	1.76	30.00	35.00	.....

		Guarantee	9.00	4.00	3.00	70.00	
129A	Pioneer Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	
129B	Pioneer Corn Chops Extra Fine.	Guarantee	9.00	4.00	3.00	70.00	
129C	Wheat Bran.....	Guarantee	16.50	4.00	9.00	53.00	
129D	Pioneer Wheat Shorts.....	Guarantee	15.00	3.50	5.00	60.00	
8T	Pioneer Wheat Shorts.....	Found....	18.08	5.73	5.88	55.47	
14T	Pioneer Wheat Shorts.....	Found....	17.48	4.79	4.01	58.16	
15T	Pioneer Wheat Shorts.....	Found....	17.22	5.27	5.02	56.93	
129E	Pioneer Corn Bran.....	Guarantee	9.00	5.00	12.00	55.00	
129F	Corn Chop and Corn Bran	Guarantee	9.00	4.00	3.00	70.00	
129G	Mixed Bran.....	Guarantee	16.50	4.00	9.00	53.00	Wheat and corn bran.
129H	Wheat Bran and Screenings	Guarantee	16.50	4.00	9.00	53.00	
64T	Wheat Bran and Screenings	Found....	18.00	4.54	9.66	50.71	
76T	Wheat Bran and Screenings	Found....	16.56	4.10	9.51	52.69	
126T	Wheat Bran and Screenings	Found....	17.41	4.06	9.99	50.73	
129I	Mixed Bran and Screenings	Guarantee	16.50	4.00	9.00	53.00	Wheat bran, corn bran and screen- ings.
129J	Wheat Brown Shorts.....	Guarantee	16.00	3.50	6.00	55.00	
129J	Wheat Brown Shorts.....	Found....	19.01	5.77	5.15	53.84	
127T	Wheat Brown Shorts.....	Found....	18.93	4.67	4.55	56.90	
129K	Wheat White Shorts.....	Guarantee	15.50	3.00	3.50	60.00	
129K	Wheat White Shorts.....	Found....	19.35	5.29	4.84	58.46	
90T	Wheat White Shorts.....	Found....	18.72	4.72	4.79	56.87	
129L	Mixed Chicken Feed.....	Guarantee	12.00	3.00	3.50	60.00	Wheat screenings, corn and milo chops.
129L	Mixed Chicken Feed.....	Found....	12.74	2.84	3.02	68.48	
1894A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	24.00	
9T	Cottonseed Meal.....	Found....	46.38	8.74	7.67	26.74	
1894B	Cottonseed Cake.....	Guarantee	44.00	7.00	11.00	24.00	
13T	Cottonseed Cake.....	Found....	46.35	7.70	9.18	25.24	
1894C	Mixed Feed.....	Guarantee	11.00	3.00	42.00	30.00	Cottonseed meal and hulls.
65T	Mixed Feed.....	Found....	4.79	.99	48.73	33.35	Excess hulls.
57A	Dried Brewers Grain.....	Guarantee	20.00	6.00	18.22	45.02	
68T	Dried Brewers Grain.....	Found....	17.78	7.81	16.81	47.96	
1833A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	
124T	Corn Chops.....	Found....	9.75	3.82	2.19	71.97	

Pioneer Flour Mills.....

Russell-Coleman Cotton
Oil Co.

San Antonio Brewing Asso-
ciation.

San Antonio Mill and
Elevator Co.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
1833B	Milo Chops.	San Antonio Mill and Elevator Co.—Continued.	Guarantee	9.00	2.50	3.00	70.00	Adulterated Hulls.	
1833C	Wheat Bran.		Guarantee	16.00	3.50	8.50	50.00		
1833D	Corn and Milo Chops.		Guarantee	9.00	2.50	3.00	70.00		
1833E	Corn and Milo Chops.		Found. . .	10.63	3.47	2.99	71.27		
1833F	Corn Bran.		Guarantee	9.75	6.11	8.79	63.96		
1833G	Kafir Chops.		Guarantee	9.00	2.50	3.00	70.00		
1833F	Kafir Chops.		Found. . .	10.31	2.87	2.48	72.66		
430A	Cottonseed Meal.	San Antonio Oil Works.	Guarantee	44.00	7.00	11.00	22.00		
2132A	Satex Egg Mash with Charcoal.	Satex Seed Co.	Guarantee	20.00	5.00	9.00	45.00	Alfalfa, corn, cottonseed and linseed meal, wheat bran and shorts, dried brewers' grain, beef scraps and charcoal.	
2132A	Satex Egg Mash with Charcoal.		Found. . .	22.30	4.86	11.11	44.85		
2132B	Satex Scratch Feed.		Guarantee	10.50	3.50	3.00	68.50	Wheat, milo, kafir, cracked corn and sunflower seed.	
2132B	Satex Scratch Feed.	Tamalina Milling Co.	Found. . .	10.36	3.36	3.00	69.74		
1649A	Corn Chops and Corn Bran		Guarantee	9.00	3.50	3.00	70.00		
1649B	Corn Chops.		Guarantee	10.00	4.00	3.00	70.00		
1649C	Tamilko Feed.		Guarantee	10.00	4.00	8.00	60.00	Corn bran and screenings.	
1821A	Mission Hen Food.	Tex-Mex Milling Co.	Guarantee	9.50	1.90	2.50	70.00	Milo, wheat, cracked corn and rice.	
1948A	Corn Chops and Corn Bran	Wagoner Grain Co.	Guarantee	9.00	3.50	3.00	70.00		
1948B	Jersey Milk Cow Food.		Guarantee	18.00	5.00	12.00	42.00	Wheat bran, malt, rice bran, alfalfa and cottonseed meal.	
930A	Cottonseed Meal.		Guarantee	44.00	7.00	11.00	22.00		

10T	Cottonseed Meal.....	Found.....	46.85	9.34	7.67	23.64
930B	Cottonseed Cake.....	Guarantee	44.00	7.00	11.00	22.00
930C	Cottonseed Meal and Hulls.....	Guarantee	41.00	5.00	14.00	24.00
930C	Cottonseed Meal and Hulls.....	Found....	44.13	9.65	8.70	26.15
930D	Cottonseed Meal and Hulls.....	Guarantee	30.00	5.00	24.00	26.00
930D	Cottonseed Meal and Hulls.....	Found....	34.50	7.14	17.98	28.76

Western Cotton Oil Co....

SAN AUGUSTINE, TEXAS.

1885A	Cold Pressed Cottonseed.....	San Augustine Cotton Oil Co.	Guarantee	25.00	6.00	26.00	28.00
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SAN BENITO, TEXAS.

1769A	Corn Chops.....	Guarantee	9.00	3.00	3.00	70.00
1769B	Sucrene Stock Feed.....	Guarantee	8.50	7.00	12.00	50.00
871	Sucrene Stock Feed.....	Found....	9.38	5.94	5.72	47.84

San Benito Commission Co.

SANDIA, TEXAS.

2177A	Kafir Chops.....	Guarantee	10.50	2.75	3.00	69.50
2177A	Kafir Chops.....	Found....	10.81	3.12	2.66	72.57

J. H. Hargrove.....

SAN ELIZARIO, TEXAS.

321A	Wheat Bran.....	Guarantee	14.50	3.00	10.00	52.00
321B	Wheat Shorts.....	Guarantee	15.00	3.00	5.00	60.00

San Elizario Roller Mills..

SANGER, TEXAS.

648A	Corn Chops.....	D. L. Lewis.....	Guarantee	9.00	4.00	3.00	70.00
210A	Corn Chops.....	Sanger Mill and Elevator Co.	Guarantee	9.50	3.50	2.50	71.50
210B	Wheat Bran.....		Guarantee	17.50	3.80	8.40	54.00
210C	Corn Chops and Corn Bran		Guarantee	9.50	3.50	3.50	71.50
210D	Wheat Bran and Screenings		Guarantee	18.17	4.27	7.39	54.35
13P	Wheat Bran and Screenings		Found....	16.54	4.15	7.20	56.86
210E	Mixed Feed.....		Guarantee	13.50	3.65	5.45	62.75
210F	Wheat Bran, Corn Bran and Wheat Screenings.		Guarantee	18.00	4.50	7.50	55.00
210G	Milo Chops.....		Guarantee	10.00	2.75	3.00	68.00
210G	Milo Chops.....		Found....	11.69	2.90	2.08	75.30

Excess screenings.

Wheat bran and milo chops.....

SAN MARCOS, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitrogen Extract	Ingredients.	Remarks.
2019A	Corn Chops.....	Riverside Farm.....	{ Guarantee Found.... }	9.00	3.50	3.00	70.00	Adul. corn bran.	
2019A	Corn Chops.....			10.02	3.59	2.34	71.99		
1935A	Corn Chops.....	San Marcos Milling Co.....	{ Guarantee Found.... }	9.00	3.50	3.00	70.00		
737	Corn Chops.....			9.27	4.62	3.76	70.24		
528A	Cottonseed Meal.....	San Marcos Oil and Gin Co.	{ Guarantee Found.... }	44.00	6.00	11.00	24.00		
277	Cottonseed Meal.....			49.13	8.38	6.32	23.65		
528B	Cottonseed Cake.....			44.00	7.00	11.00	25.00		

SAN SABA, TEXAS.

793A	Cottonseed Cake and Hulls	San Saba Cotton Oil Co....	{ Guarantee Found.... }	38.00	6.00	14.00	25.00		
793A	Cottonseed Cake and Hulls			41.63	7.02	13.20	25.22		
793B	Cottonseed Meal and Hulls			38.00	6.00	14.00	25.00		
793B	Cottonseed Meal and Hulls			40.69	7.66	13.20	24.93		
2133A	Corn Chops.....	San Saba Milling Co.....	{ Guarantee Found.... }	9.00	3.50	3.00	70.00		
2133A	Corn Chops.....			10.06	4.05	2.25	69.38		

SANSOM, TEXAS.

176A	Corn Chops.....	Sunset Grain Co.....	{ Guarantee Found.... }	9.00	3.50	3.00	70.00		
176B	Milo Chops.....			9.50	2.50	3.00	71.00		

SANTA ANNA, TEXAS.

2007A	Milo Chops.....	W. R. Kelly & Co.....	{ Guarantee Found.... }	10.00	2.50	3.00	70.00		
2007A	Milo Chops.....			12.75	3.13	2.31	70.13		

SANTA ANA, CALIFORNIA.

1839A	Larroe's Dried Beet Pulp...	Santa Ana Co-operative Sugar Co.	Guarantee	8.00	.50	20.00	58.00
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SARCOXIE, MISSOURI.

1228A	Wheat Bran.....	Boyd & Brizmore.....	Guarantee	14.50	3.50	10.00	52.00
1228B	Wheat Shorts.....		Guarantee	16.00	4.00	5.00	60.00
1228C	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00
1394A	Wheat Bran.....	Sarcxie Electric Light and Milling Co.	Guarantee	14.50	3.50	10.00	52.00
1394C	Corn Chops.....		Guarantee	9.00	3.00	3.50	70.00

SCHULENBURG, TEXAS.

2199A	Corn Chops.....	Cranz & Kessler.....	Guarantee	9.00	3.50	3.00	70.00
2199A	Corn Chops.....		Found....	10.25	3.77	2.46	72.43
404A	Cottonseed Meal.....	Schulenburg Oil Mill.....	Guarantee	44.00	7.00	11.00	24.00
1T	Cottonseed Meal.....		Found....	45.69	9.83	4.73	27.07
100T	Cottonseed Meal.....		Found....	45.25	8.26	10.63	24.01

SCHUYLER, NEBRASKA.

1544A	Wheat Bran.....	Wells-Abbot-Nieman.....	Guarantee	14.50	3.50	10.00	52.00
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SEALY, TEXAS.

399A	Corn Chops.....	Charles Krampitz.....	Guarantee	9.60	3.90	2.52	71.31
399B	Corn and Cob Meal.....		Guarantee	7.35	3.00	10.28	65.00
1449A	Cottonseed Meal.....	Sealy Oil Mill and Manufacturing Co.	Guarantee	44.00	7.00	11.00	24.00
1449A	Cottonseed Meal.....		Found....	43.71	7.84	10.27	24.24
23T	Cottonseed Meal.....		Found....	43.38	9.10	9.66	24.69
1449B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	24.00
1449B	Cottonseed Cake.....		Found....	45.00	8.68	8.20	23.04
1449E	Cottonseed Cake and Hulls		Guarantee	40.00	7.00	11.00	20.00

SEALY, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen.	Ingredients.	Remarks.
80T 1449F	Cottonseed Cake and Hulls Cottonseed Meal and Hulls	Sealy Oil Mill and Manufacturing Co.—Cont'd.	Found..... Guarantee	45.20 41.00	7.69 7.00	9.20 12.00	23.16 22.00		
238A	Corn Chops.....	Sealy Grist Mill.....	Guarantee	9.00	3.00	3.00	70.00		
SEGUIN, TEXAS.									
253A	Corn Chops.....	Citizens Mill and Brokerage Co.	Guarantee	9.30	4.10	2.50	71.70		
441A	Cottonseed Meal.....	Industrial Cotton Oil Properties.	Guarantee	44.00	7.00	11.00	23.00		
17T	Cottonseed Meal.....		Found....	44.50	7.54	9.56	25.24		
441B	Screened Cottonseed Cake..		Guarantee	44.00	7.00	11.00	23.00		
86T	Screened Cottonseed Cake..		Found....	45.10	6.71	10.30	26.45		
103A	Corn Chops.....	Sequin Mill and Power Co.	Guarantee	9.70	4.15	2.10	73.20		
103B	Wheat Bran.....		Guarantee	17.56	3.86	8.42	54.05		
103C	Wheat Shorts.....		Guarantee	15.25	3.38	3.63	63.11		
109T	Wheat Shorts.....		Found....	18.08	4.05	4.25	58.92		
103E	Corn Chops, Corn Bran and Ground Corn Cob.	Sequin Mill and Power Co.	Guarantee	8.60	4.00	7.03	67.50		
103F	Ear Corn Chops.....		Guarantee	8.50	3.90	7.86	65.88		
103G	Corn Chops and Corn Bran		Guarantee	8.75	3.25	3.00	67.00		
103H	Corn Bran.....		Guarantee	9.00	5.25	4.90	61.00		
103I	Wheat Bran and Ground Screenings.	Sequin Mill and Power Co.	Guarantee	16.00	3.50	9.00	56.00		
82T	Wheat Bran and Ground Screenings.		Found....	16.81	4.78	9.41	49.41		
103J	Corn and Milo Chops.....		Guarantee	9.50	3.00	2.75	70.00		
103K	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50		
103L	Milo Meal.....		Guarantee	9.00	3.00	3.00	70.00		

SEMINOLE, TEXAS.

951A	Corn Chops.....	W. H. Brennand.....	Guarantee	9.00	4.00	3.00	70.00
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SENECA, MISSOURI.

406A	Corn Chops.....	Seneca Mill and Elevator Co.	Guarantee	9.00	3.50	3.00	70.00
406B	Wheat Bran.....		Guarantee	16.00	4.50	9.39	50.28	.....

SEYMOUR, TEXAS.

109A	Corn Feed Meal.....	Fuller Grain Co.	Guarantee	9.00	3.50	3.00	70.00	.....
109A	Corn Feed Meal.....		Found.....	10.00	3.95	2.69	69.92	.....
109B	Milo Meal.....		Guarantee	10.00	2.75	3.00	68.00	.....
109B	Milo Meal.....		Found.....	11.75	3.00	2.69	68.48	.....
109C	Mixed Feed.....	Seymour Cotton Oil Co.	Guarantee	11.50	2.40	9.50	68.00	Milo meal and ground wheat screenings.
109C	Mixed Feed.....		Found.....	13.47	2.73	3.92	65.94	.....
109D	Wheat Screenings.....		Guarantee	15.00	2.00	3.50	65.00	.....
109D	Wheat Screenings.....		Found.....	15.35	2.36	5.23	65.08	.....
581A	Cottonseed Meal.....	Seymour Mill, Elevator and Light Co.	Guarantee	44.00	7.00	11.00	24.00	.....
581B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	24.00	.....
56P	Cottonseed Cake.....		Found.....	41.23	6.52	12.90	26.02	.....
581E	Special Mixed Feed.....		Guarantee	11.00	3.00	40.00	32.00	Cottonseed hulls and meal.
581F	Cottonseed Meal and Hulls.....	W. M. C. Mixed Feed.....	Guarantee	39.00	7.00	12.00	25.00	.....
581F	Cottonseed Meal and Hulls.....		Found.....	39.35	8.28	12.14	27.62	.....
581G	Cottonseed Cake and Hulls.....		Guarantee	39.00	7.00	12.00	25.00	.....
581G	Cottonseed Cake and Hulls.....		Found.....	38.82	7.38	12.07	29.07	.....
336A	Corn Chops.....	W. M. C. Mixed Feed.....	Guarantee	9.00	3.00	3.00	70.00	.....
336B	Wheat Bran.....		Guarantee	14.68	3.00	8.00	55.00	.....
336C	Milo Chops.....		Guarantee	9.50	2.50	3.00	71.00	.....
336D	Mixed Feed.....		Guarantee	10.50	2.75	5.00	66.00	Milo chops and wheat bran.
336E	W. M. C. Mixed Feed.....	Seymour Mill, Elevator and Light Co.	Guarantee	10.50	2.75	5.50	66.00	Wheat bran, milo chops and corn bran.
336F	Mixed Feed.....		Guarantee	14.70	3.00	8.00	55.00	Wheat bran, wheat screenings, shorts and flour.

SEYMOUR, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
336G	Corn Chops and Corn Bran	Seymour Mill, Elevator and Light Co.—Cont'd.	Guarantee	9.00	3.00	3.00	70.00	.....
336H	Cane Seed Chops.....		Guarantee	9.00	2.75	3.00	70.00	.....
336I	Milo and Cane Seed Chops.		Guarantee	9.00	2.75	3.00	70.00	.....
336J	Corn and Kafir Chops.....		Guarantee	9.25	3.00	2.50	70.00	.....
336K	Wheat Bran and Corn Bran		Guarantee	13.00	4.00	9.00	55.00	.....
336L	Feterita Chops.....		Guarantee	9.50	2.50	3.00	71.00	.....

SHAMROCK, TEXAS.

1965A	Corn Chops.....	Carl Ray Milling Co.....	Guarantee	9.00	3.50	3.00	70.00	.....
1965B	Kafir Chops.....		Guarantee	10.50	2.75	3.00	69.50	.....
1965B	Kafir Chops.....		Found....	12.88	2.78	2.17	68.11	.....
1965C	Milo Chops.....		Guarantee	10.00	2.50	3.00	71.00	.....
1965C	Milo Chops.....		Found....	9.49	3.02	2.38	72.54	.....
2098A	Corn Chops.....	C. E. Chance.....	Guarantee	9.00	3.50	3.00	70.00	.....
2098A	Corn Chops.....		Found....	10.50	4.00	2.55	70.74	.....
2098B	Milo Chops.....		Guarantee	10.00	2.50	3.00	71.00	.....
2098B	Milo Chops.....		Found....	10.25	2.98	2.03	71.96	.....
2098C	Kafir Chops.....	Shamrock Mill and Ele- vator Co.	Guarantee	10.50	2.75	3.00	69.50	.....
2098C	Kafir Chops.....		Found....	10.94	3.03	1.95	69.53	.....
2062A	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50	.....
2062A	Milo Chops.....		Found....	11.50	2.83	2.28	68.72	.....
2062B	Wheat Mixed Feed.....	Wheeler County Cotton Oil Co.	Guarantee	16.50	8.50	55.00	Wheat bran and shorts.	.....
2062C	Wheat Mixed Feed.....		Found....	16.81	3.34	8.01	56.48	.....
1758C	Cottonseed Cake and Hulls		Guarantee	40.00	6.00	12.00	23.00	.....
1758C	Cottonseed Cake and Hulls		Found....	41.26	6.41	11.00	29.13	.....
59P	Cottonseed Cake and Hulls		Found....	40.82	7.40	11.77	27.20	.....
1759D	Cottonseed Meal and Hulls		Guarantee	40.00	6.00	12.00	23.00	.....

1758D	Cottonseed Meal and Hulls	Found.	40.57	8.83	11.15	28.41	.....
1758P	Cottonseed Meal and Hulls	Found.	41.04	9.31	10.90	25.92	.....
1758E	Carter's Mixed Feed.	Guarantee	14.00	4.00	5.00	50.00	Milo and kafir chops, cottonseed meal and molasses.
1758E	Carter's Mixed Feed.	Found.	20.69	6.86	4.55	54.64	.....

SHATTUCK, OKLAHOMA.

1261A	Kafir and Milo Head Chops	Guarantee	9.00	2.50	7.50	60.00	.....
1261B	Corn Chops.	Guarantee	9.00	3.50	2.80	60.00	.....

SHAWNEE, OKLAHOMA.

670A	P. D. & S. Feed.	Guarantee	12.25	2.97	16.58	53.20	Alfalfa meal, shorts and corn chops
670B	Alfalfa Meal.	Guarantee	14.33	1.75	28.44	39.70	.....
670C	Wheat Mixed Feed.	Guarantee	16.80	3.73	8.57	54.68	Wheat bran and shorts.
670D	Wheat Shorts.	Guarantee	17.14	4.09	4.28	60.97	.....
670E	Corn Chops.	Guarantee	9.54	3.60	2.68	70.68	.....
670F	Kafir Chops.	Guarantee	10.26	3.02	2.56	72.16	.....
670G	Mixed Feed.	Guarantee	13.39	3.37	5.58	63.42	Kafir chops and wheat shorts.
670H	Mixed Feed.	Guarantee	9.30	3.50	2.58	71.57	Corn and kafir chops.
670I	Mixed Feed.	Guarantee	13.23	3.37	5.58	63.42	Wheat bran and kafir chops.
670J	Mixed Dairy Feed with Peat	Guarantee	10.50	1.50	19.00	41.50	Cottonseed meal and hulls, alfalfa meal, corn bran, ground oat feed, molasses, peat and salt.
670K	Alfalfa Molasses Mixed Feed with Peat.	Guarantee	10.00	1.00	21.00	43.00	Alfalfa meal, cane molasses, peat and salt.
63T	Alfalfa Molasses Mixed Feed with Peat.	Found.	11.19	.90	21.32	49.52	.....
670L	Molasses Mixed Feed with Peat.	Guarantee	9.00	2.25	12.00	55.00	Corn chops, oats, alfalfa meal, molasses, peat and salt.
670M	Wheat Bran and Corn Bran	Guarantee	15.20	4.10	9.42	60.00	.....
670N	Mixed Bran and Screenings	Guarantee	14.56	4.93	8.75	54.36	Wheat and corn bran and screenings.

397A	Corn Chops.	Guarantee	9.00	4.00	3.00	68.00	.....
397B	Wheat Bran.	Guarantee	14.00	3.00	10.00	50.00	.....
397C	Wheat Shorts.	Guarantee	15.75	4.25	5.00	55.00	.....

Chapman Milling Co.

SHERMAN, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
397D	Poultry Food.....	Chapman Milling Co.— Continued.	Guarantee	9.00	3.00	6.00	60.00	Corn chops, milo, wheat screenings	
397E	Wheat and Corn Bran.....		Guarantee	14.79	4.03	10.22	55.60	.....
397F	Mixed Feed.....		Guarantee	14.00	3.50	7.00	60.00	Wheat bran and kafir chops.....	
397G	Wheat Bran and Screenings		Guarantee	14.00	3.00	10.00	50.00	.....
397H	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50	.....
397I	Mixed Feed.....	Diamond Mill Company...	Guarantee	13.00	2.90	6.00	52.00	Milo chops and wheat bran.....	
245A	Corn Chops.....		Guarantee	9.00	3.00	3.00	70.00	.....
245B	Wheat Bran.....		Guarantee	14.50	3.50	8.00	55.00	.....
245C	Wheat Shorts.....		Guarantee	15.00	3.50	3.00	60.00	.....
10R	Wheat Shorts.....		Found.	19.79	5.64	3.67	58.51	.....
245D	Mixed Bran.....	A. M. Ferguson.....	Guarantee	14.00	3.50	8.00	55.00	Wheat and corn bran.....	
245E	Corn Chops and Corn Bran		Guarantee	9.00	3.00	3.00	70.00	.....
245F	Wheat Bran and Screenings		Guarantee	14.00	3.50	8.00	55.00	.....
1692A	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....
1710A	Corn Chops.....	Gladney Milling Co.....	Guarantee	9.00	3.00	3.50	70.00	.....
1710C	Gray Wheat Shorts.....		Guarantee	15.00	3.50	5.00	55.00	.....
1710D	White Wheat Shorts.....		Guarantee	15.00	5.00	3.50	55.00	.....
1710E	Gladney's Mixed Bran.....		Guarantee	14.00	3.00	12.00	50.00	Wheat and corn bran.....	
1710F	Corn Chops and Corn Bran		Guarantee	9.00	3.00	3.50	70.00	.....
1710G	Gladney Mixed Feed.....	Gladney Milling Co.....	Guarantee	14.00	3.00	12.00	50.00	Wheat and corn bran and screenings.	
1710H	Wheat Bran and Screenings		Guarantee	14.50	3.50	10.00	50.00	.....
1710I	Milo Chops.....		Guarantee	10.00	2.75	3.00	70.00	.....
1710J	Texo Stock Food.....		Guarantee	11.80	3.15	4.15	67.90	Milo chops and wheat bran.....	
1710K	White Corn Bran.....		Guarantee	9.00	5.00	12.00	50.00	.....
249A	Corn Chops.....	Ear Corn Chops.	Guarantee	9.00	3.30	3.00	68.00	.....
249C	Ear Corn Chops.....		Guarantee	8.50	3.50	10.00	66.00	.....
249D	Kafir Chops.....		Guarantee	9.50	2.75	3.00	71.00	.....

249E	Little Chick Feed.....	Guarantee	12.81	2.18	1.61	66.36	Corn chops, kafir, milo and wheat..
249F	Poultry Food.....	Guarantee	12.81	2.18	1.61	66.36	Corn chops, kafir, milo and wheat..
249G	Poultry Food with Grit and Charcoal.	Guarantee	10.75	2.50	3.75	68.00	Wheat, milo, kafir, cracked corn, seed screenings, charcoal and grit.
249H	Chick Food with Grit and Charcoal.	Guarantee	10.75	2.50	3.75	68.00	Wheat, milo, kafir, cracked corn, seed screenings, charcoal and grit.
249I	Alfalfa Meal.....	Guarantee	13.50	1.50	30.00	36.00	
249J	Alfalfa Meal.....	Found....	14.07	1.31	38.42	36.12	
608A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.60	
625A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	
261A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	23.00	
261B	Milk Maker Mixture.....	Guarantee	10.50	3.00	40.00	30.00	Cottonseed hulls and meal.
77Y	Milk Maker Mixture.....	Found....	11.75	2.60	38.69	32.35	
261C	Cottonseed Cake.....	Guarantee	44.00	7.00	11.00	23.00	
261E	Cottonseed Meal and Hulls	Guarantee	40.00	7.00	13.00	23.00	
261E	Cottonseed Meal and Hulls	Found....	39.88	8.27	12.31	26.34	
79Y	Cottonseed Meal and Hulls	Found.....	38.07	9.10	12.80	26.84	
261F	Cottonseed Cake and Hulls	Guarantee	40.00	7.00	13.00	23.00	
261F	Cottonseed Cake and Hulls	Found....	41.69	6.74	11.64	25.36	
78Y	Cottonseed Cake and Hulls	Found....	40.94	6.88	11.73	25.77	
261G	Peacock Brand Cottonseed Meal and Hulls.	Guarantee	38.62	5.38	17.00	22.00	
261G	Peacock Brand Cottonseed Meal and Hulls.	Found....	38.00	7.68	12.15	27.93	
261H	Peacock Brand Cottonseed Cake and Hulls.	Guarantee	38.62	5.38	17.00	22.00	
261H	Peacock Brand Cottonseed Cake and Hulls.	Found....	38.92	6.40	10.78	28.53	
261I	Cream Brand Cottonseed Meal and Hulls.	Guarantee	41.00	5.00	14.00	24.00	
261I	Cream Brand Cottonseed Meal and Hulls.	Found....	39.19	7.28	11.16	28.04	
261J	Cream Brand Cottonseed Cake and Hulls.	Guarantee	41.00	5.00	14.00	24.00	
261J	Cream Brand Cottonseed Cake and Hulls.	Found....	40.19	7.28	10.50	28.30	

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitrogen- Free Extrac- t.	Ingredients.	Remarks.
1007A	Wheat Shorts.....	G. B. R. Smith Milling Co.	Guarantee	14.50	3.50	5.00	55.00	.....
125Y	Wheat Shorts.....		Found....	17.31	4.32	7.40	54.23	.....
1007B	Wheat Bran.....		Guarantee	17.12	3.07	7.22	58.12	.....
1007C	Corn Chops.....		Guarantee	9.00	3.75	3.00	65.00	.....
1007D	Wheat and Corn Bran.....		Guarantee	13.50	3.50	10.00	55.00	.....
1007E	Mixed Wheat and Corn Bran		Guarantee	12.00	2.75	11.00	54.00	.....
1007F	Corn Chops and Corn Bran		Guarantee	9.00	3.75	3.00	65.00	.....
1007G	Corn Bran.....		Guarantee	8.00	3.00	12.00	60.00	.....
1007H	Wheat Screenings.....		Guarantee	14.00	1.75	2.15	65.00	.....
1007I	Wheat Bran and Screenings		Guarantee	17.12	2.07	7.22	63.12	.....
1007J	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50	.....
1007K	Mixed Feed.....		Guarantee	9.50	3.00	3.75	44.25	Milo chops, corn bran and corn chops	
1007L	Mixed Feed.....		Guarantee	12.75	2.75	5.75	63.25	Milo chops, wheat bran and screen- ing.	
1197A	Corn Chops.....	Texas Seed Breeding Farms	Guarantee	9.00	4.00	3.00	70.00	.....

SHERWOOD, TEXAS.

1056A	Milo Chops.....	J. B. St. Clair.....	Guarantee	9.00	2.50	3.50	70.00	.....
1056B	Kafir Chops.....		Guarantee	9.00	2.50	3.50	70.00	.....
1056C	Corn Chops.....		Guarantee	9.00	3.00	3.00	70.00	.....

SHINER, TEXAS.

267A	Cottonseed Meal.....	Shiner Oil Mill and Manu- facturing Co.	Guarantee	44.00	7.00	11.00	20.00	.....
267B	Cottonseed Meal.....		Found....	47.31	7.93	8.66	24.85	.....
267C	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	23.00	.....
267D	Choice Cottonseed Cake.....		Guarantee	47.80	7.20	8.50	24.00	.....
267E	Choice Cottonseed Cake.....		Found....	48.38	7.11	6.90	24.59	.....
597	Choice Cottonseed Cake.....		Found....	48.47	7.00	6.23	24.55	.....

SHREVEPORT, LOUISIANA.

515B	Cold Pressed Cottonseed....	Caddo Cotton Oil Co.....	{ Guarantee	24.50	5.50	25.00	28.00	.....
515C	Ground Cold Pressed Cottonseed.		{ Guarantee	24.50	5.50	25.00	28.00	.....
2099A	Kaddo Kow Dairy Feed....		{ Guarantee	14.00	5.50	16.00	48.00	Cottonseed, alfalfa and corn meal,
2099A	Kaddo Kow Dairy Feed....	Doherty & Johnson.....	{ Pound.....	14.63	5.19	14.78	46.06	rice bran, molasses and salt
556A	Cottonseed Meal.....		{ Guarantee	44.00	7.00	11.00	23.00	.....
556B	Mixed Feed.....	Louisiana Cotton Oil Co....	{ Guarantee	9.50	3.00	45.00	25.00	Cottonseed hulls and meal.....
556C	Horse and Mule Feed.....		{ Guarantee	11.50	4.00	12.00	54.50	Alfalfa meal, corn chops and oats...
1703A	Corn Chops.....	Shreveport Mill and Elevator Co.	{ Guarantee	9.00	3.60	2.20	72.00	.....
963A	Corn Chops.....	Taylor Neilson Co.....	{ Guarantee	9.00	3.00	3.50	70.00	.....

SIKESTON, MISSOURI.

791A	Corn Chops.....	Scott County Milling Co.. {	Guarantee	9.00	3.50	3.50	65.00	.....
791B	Wheat Bran.....		{ Guarantee	14.50	4.00	9.50	52.25	.....

SILVERTON, TEXAS.

1940A	Milo Chops.....	J. R. Burson.....	{ Guarantee	9.00	2.50	3.50	70.00	.....
1608A	Kafir Head Chops.....	H. G. Arnold.....	{ Guarantee	8.00	2.50	8.00	70.00

SIPE SPRINGS, TEXAS.

1645A	Corn Chops.....	J. W. King.....	{ Guarantee	9.00	3.50	3.00	70.00
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SKIDMORE, TEXAS.

1585A	Corn Chops.....	H. J. Bissett.....	{ Guarantee	9.00	3.50	3.00	70.00
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SINTON, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen- Free Extract.	Ingredients.	Remarks.
1910A	Corn Chops.....	M. M. Simms.....	Guarantee	9.00	3.50	3.00	70.00	.....	.....

SMITHVILLE, TEXAS.

448A	Cottonseed Meal.....	Smithville Oil Mill Co.....	Guarantee	44.00	7.00	11.00	22.00	.....	.....
25T	Cottonseed Meal.....		Found....	48.58	11.81	5.49	22.17	.....	.....

SNYDER, TEXAS.

1945A	Mixed Chops.....	J. W. Berry.....	Guarantee	9.50	2.50	3.00	70.00	Milo, kafir and feterita chops.....	.....
1161A	Corn Chops.....	Brice-Burnett & Co.....	Guarantee	9.00	3.50	3.50	70.00	.....	.....
2140A	Milo Head Chops.....	Darby, Son & Higgin- botham.	Guarantee	9.75	2.40	7.50	65.00	.....	.....
2140A	Milo Head Chops.....		Found....	11.00	2.38	6.82	68.13	.....	.....
2140B	Milo Chops.....		Found....	11.84	2.48	2.97	69.64	.....	.....
2140B	Milo Chops.....		Guarantee	10.00	2.50	3.00	71.00	.....	.....
1892A	Dawson Stock Food No. 2..	J. S. Dawson.....	Guarantee	9.25	2.25	7.50	65.00	Milo and kafir head chops.....	.....
1892B	Dawson Stock Food No. 1..		Guarantee	10.00	2.65	3.00	69.50	Crushed milo and kafir.....	.....
1693A	Milo and Kafir Head Chops..	Farmers Union Mercantile Co.	Guarantee	8.50	2.75	7.50	68.00	.....	.....
1866A	Cottonseed Cake.....	Fuller Cotton Oil Co.....	Guarantee	44.00	7.00	11.00	22.00	.....	.....
44W	Cottonseed Cake.....		Found....	45.51	7.90	7.60	25.72	.....	.....
1866B	Cottonseed Meal.....		Guarantee	44.00	7.00	11.00	22.00	.....	.....
45W	Cottonseed Meal.....		Found....	44.07	9.76	9.93	23.84	.....	.....

SARCO CREEK, TEXAS.

892A	Corn Chops.....	C. S. Riemenschneider.....	Guarantee	9.00	4.00	3.00	70.00
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SOUTHMAYD, TEXAS.

1284A	Corn Chops.....	Brooks & Woodruff.....	Guarantee	9.00	3.00	3.50	70.00
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SPRINGFIELD, MISSOURI.

337A	Wheat Mixed Feed.....	Eisenmayer Milling Co.....	Guarantee	16.00	4.00	8.00	54.00	Wheat bran and shorts.....
337B	Winter Wheat Middlings.....		Guarantee	15.00	4.00	3.00	65.00	.....
311A	Corn Chops.....	John F. Meyer & Sons Milling Co.	Guarantee	9.00	4.00	3.00	70.00	.....
311B	Wheat Bran and Screenings		Guarantee	15.75	4.96	10.00	50.75	.....
311C	Albatross Wheat Middlings		Guarantee	14.00	4.00	3.50	63.00	.....
311D	Albatross Feed.....		Guarantee	14.00	3.50	10.00	54.50	Wheat bran, shorts and ground screenings.
311E	Model Feed.....		Guarantee	14.50	3.50	8.50	54.00	Wheat bran, shorts and ground screenings.
311F	Wheat Shorts and Screenings.	Springfield Wholesale Flour and Feed Co.	Guarantee	15.50	4.38	10.00	61.00	.....
67P	Wheat Shorts and Screenings.		Found.	16.38	4.05	8.32	54.06	.....
1438A	Corn Chops.....	R. C. Stone Milling Co. . .	Guarantee	9.00	3.50	3.00	70.00	.....
299A	Wheat Bran.....		Guarantee	16.20	4.52	8.20	52.96	.....
299B	Corn Chops.....		Guarantee	9.50	4.00	2.48	70.70	.....

SPUR, TEXAS.

1897A	Corn Chops.....	Spur Grain and Coal Co.....	Guarantee	9.00	3.50	3.00	70.00	.....
2074A	Corn Chops.....	Spur Milling and Grain-Co.	Guarantee	9.50	3.50	3.00	70.00	.....
2074A	Corn Chops.....		Found.	10.13	5.21	2.15	70.73	.....
2074B	Milo Head Chops.....		Guarantee	9.75	2.40	7.50	65.00	.....
2074B	Milo Head Chops.....		Found.	9.51	2.50	6.14	71.59	.....
2074C	Milo Chops.....		Guarantee	10.00	2.50	3.00	71.00	.....
2074C	Milo Chops.....	Ear Corn Chops with Shuck	Found.	10.31	2.93	2.64	71.71	.....
2074D	Ear Corn Chops with Shuck		Guarantee	7.75	2.75	10.00	62.00	.....
2074D	Ear Corn Chops with Shuck		Found.	8.31	3.39	9.11	69.78	.....

SPUR, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
2146A	Cold Pressed Cottonseed...	Spur Oil Mill Co.	Guarantee	28.00	7.00	26.00	28.00		
2146A	Cold Pressed Cottonseed...		Found....	27.19	7.40	22.76	31.03		
STAMFORD, TEXAS.									
66A	Corn Chops.....	Stamford Mill and Ele- vator Co.	Guarantee	9.00	3.00	3.00	65.00		
73W	Corn Chops.....		Found....	9.75	4.29	2.65	71.54		
66B	Mixed Bran.....		Guarantee	14.00	3.75	8.00	50.00	Wheat and corn bran.	
66C	Mixed Feed.....		Guarantee	14.50	3.50	6.50	60.00	Wheat bran and kafir.	
66D	Mixed Chops.....		Guarantee	9.50	3.40	3.00	70.00	Corn and milo chops.	
74W	Mixed Chops.....		Found....	11.25	3.40	2.59	71.00		
66E	Milo Chops.....		Guarantee	10.60	2.75	3.50	70.00		
72W	Milo Chops.....		Found....	12.25	2.79	2.36	70.59		
66F	Mixed Feed.....		Guarantee	14.50	3.30	6.50	60.00	Wheat bran and ground kafir.	
66G	Mixed Feed.....		Guarantee	13.00	3.50	6.75	60.00	Ground wheat screenings, milo and corn bran.	
66H	Mixed Feed.....		Guarantee	13.00	2.00	6.75	60.00	Ground wheat screenings, milo and corn bran.	
66I	Mixed Feed.....		Guarantee	13.00	3.50	6.75	60.00	Wheat bran, corn bran and ground kafir.	
66K	Stamco Bran Mixture.....		Guarantee	12.00	3.00	13.00	54.00	Wheat bran, wheat flour, ground milo and rice hulls.	
66L	Mixed Feed.....		Guarantee	13.00	3.50	7.00	50.00	Wheat bran, wheat flour and ground rice hulls.	
66M	Wheat Shorts.....		Guarantee	16.00	4.00	4.00	60.00		
75W	Wheat Shorts.....		Found....	16.44	3.60	3.56	65.15		
66N	Mixed Feed.....	Guarantee	11.00	3.00	13.00	55.00	Wheat bran, ground milo and rice hulls.		
66O	Kafir Chops.....	Guarantee	10.60	2.75	3.00	70.00			
66P	Mixed Chops.....	Guarantee	9.50	3.40	3.00	70.00	Corn and kafir chops.		

Grade	Product	Guarantee	11.00	3.00	13.00	55.00	Wheat bran, ground kafir and ground rice hulls.
66Q	Mixed Feed.....	Guarantee	11.00	3.00	13.00	55.00	Wheat bran, ground kafir and ground rice hulls.
66R	Mixed Bran and Screenings	Guarantee	14.00	3.75	8.00	50.00	Wheat bran and shorts, screenings and corn bran.
70W	Mixed Bran and Screenings	Found....	16.44	3.93	7.40	57.23	
66S	Corn Chops and Corn Bran	Guarantee	9.00	3.00	3.00	70.00	
66T	Mixed Feed.....	Guarantee	14.00	3.40	12.00	53.00	Wheat bran, flour and ground rice hulls.
66U	Monarch Milk Maker Mixed Feed.	Guarantee	12.00	1.90	17.00	50.00	Ground milo head stems, cottonseed meal, molasses and rock salt.
66U	Monarch Milk Maker Mixed Feed.	Found....	12.88	1.73	16.60	49.30	
66V	Monarch Stock Mixed Feed	Guarantee	9.00	1.95	13.00	55.00	Ground milo head stems, molasses, milo chops, wheat bran and cottonseed meal.
66V	Monarch Stock Mixed Feed	Found....	12.05	1.74	12.59	55.12	
66W	Royal Mixed Feed.....	Guarantee	7.25	1.45	12.00	61.00	Milo chops, ground milo head stems, molasses and rock salt.
66W	Royal Mixed Feed.....	Found....	8.38	2.03	9.05	63.06	
439A	Cottonseed Meal.	Guarantee	44.00	8.00	8.00	23.00	
439B	Cottonseed Cake.	Guarantee	44.00	8.00	8.00	23.00	
439C	Off Cottonseed Meal.	Guarantee	35.00	7.00	15.00	22.00	
439E	Ideal Mixed Feed.	Guarantee	12.00	3.20	37.60	32.60	Cottonseed hulls and meal.
28W	Ideal Mixed Feed.	Found....	13.00	3.30	38.25	29.90	
439F	Ideal Mixed Feed.	Guarantee	10.80	3.02	38.71	32.96	Cottonseed hulls and meal.
439G	Ideal Mixed Feed No. 2.....	Guarantee	10.50	2.50	38.00	35.00	Cottonseed hulls and meal.
439H	Cottonseed Meal and Hulls	Guarantee	42.00	8.00	12.00	23.00	
439H	Cottonseed Meal and Hulls	Found....	42.61	8.83	10.70	24.22	
27W	Cottonseed Meal and Hulls	Found....	41.32	9.41	11.38	24.50	
439I	Cottonseed Cake and Hulls	Guarantee	42.00	8.00	12.00	23.00	
439I	Cottonseed Cake and Hulls	Found....	43.04	7.44	10.50	25.25	
29W	Cottonseed Cake and Hulls	Found....	41.32	6.91	11.34	25.32	

STEPHENVILLE, TEXAS.

Grade	Product	Guarantee	15.00	3.50	9.00	54.00
12131A	Wheat Bran.....	Guarantee	15.00	3.50	9.00	54.00
12131A	Wheat Bran.....	Found....	15.41	2.58	4.70	60.49
12131B	Corn Chops.....	Guarantee	9.50	3.50	3.00	70.00
12131B	Corn Chops.....	Found....	9.24	4.28	2.50	72.76

Arendell Brothers.

STEPHENVILLE, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
605A	Cottonseed Meal and Hulls	Bencini Cotton Oil Mills.	Guarantee	41.00	6.00	12.00	22.00	.....
605A	Cottonseed Meal and Hulls		Found....	40.50	7.09	11.39	24.95	.....
65W	Cottonseed Meal and Hulls		Found....	46.42	6.59	9.14	24.44	.....
65W	Cottonseed Meal and Hulls		Found....	43.01	7.42	10.64	24.85	.....
STILLWATER, OKLAHOMA.									
1139A	Corn Chops.....	Stillwater Mill and Elevator Co.	Guarantee	9.88	3.61	2.61	69.00	.....

STOCKDALE, TEXAS.

1066A	Cold Pressed Cottonseed	Stockdale Cottonseed Oil Mill Co.	Guarantee	25.00	6.00	25.00	28.00		
16T	Cold Pressed Cottonseed		Found	27.12	6.43	25.34	24.22		
1066B	Whole Pressed Peanut Cake		Guarantee	36.00	6.00	20.00	23.00		
1066B	Whole Pressed Peanut Cake		Found	34.16	10.72	20.53	19.63		
108T	Whole Pressed Peanut Cake		Found	34.19	11.06	20.94	20.75		

STONEBURG, TEXAS.

859A	Corn Chops.	W. V. Smith.	Guarantee	9.00	4.00	3.00	70.00		
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STRATFORD, TEXAS.

2102A	Wheat Mixed Feed	E. W. Caldwell.	Guarantee	16.00	3.60	8.00	55.00	Wheat shorts and bran.	
2102A	Wheat Mixed Feed		Found	15.38	3.67	6.18	58.01		

STRAWN, TEXAS.

2170A	Wheat Bran and Screenings	Strawn Flour Milling Co.	Guarantee	14.50	3.00	10.00	54.00		
2176A	Wheat Bran and Screenings		Found	20.82	4.60	7.81	51.62		

STREETMAN, TEXAS.

762A	Corn Chops.....	Streetman Corn Mill Co.....	Guarantee	9.00	3.00	3.50	70.00	
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STUTTGART, ARKANSAS.

613A	Rice Bran.....	Stuttgart Rice Milling Co....	Guarantee	12.80	13.53	8.65	46.31	
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SUGARLAND, TEXAS.

864A	Cold Pressed Cottonseed.....	Imperial Mercantile Co.....	Guarantee	25.00	6.00	26.00	28.00	
528A	Eldridge Mixtrite Stock Feed with Peat-Hog Feed	Sugarland Manufacturing Co.	Guarantee	9.00	2.45	9.75	47.00	Molasses, alfalfa and cottonseed meal, rice bran and peat.
528B	Eldridge Mixtrite Stock Feed with Peat.		Guarantee	8.25	1.50	35.00	40.00	Molasses, cottonseed meal and hulls and peat.
528C	Eldridge Stock Feed with Peat for Horses and Mules		Guarantee	6.50	1.25	24.00	50.00	Molasses, alfalfa and cottonseed meal and hulls, oat screenings and peat.
528E	Eldridge Mixtrite Stock Feed with Peat-Cattle Feed.		Guarantee	6.50	1.15	17.00	45.50	Alfalfa and cottonseed meal and hulls, blackstrap molasses and peat.
528F	Eldridge Mixtrite Stock Feed with Peat-Cattle Feed.		Guarantee	15.75	4.50	9.50	46.00	Molasses, cottonseed and alfalfa meal, cottonseed hulls and peat.
528G	Eldridge Mixtrite Stock Feed with Peat-Cattle Feed.		Guarantee	12.50	3.25	15.00	45.00	Molasses, cold pressed cottonseed, cottonseed hulls and peat.
528H	Eldridge Mixtrite Stock Feed with Peat.	Found.....	Guarantee	8.50	1.50	20.00	42.00	Molasses, delinted cottonseed hulls, alfalfa and cottonseed meal, oat clippings and peat.
528I	Eldridge Mixtrite Stock Feed with Peat.		Found.....	8.57	1.45	23.70	48.30	
528J	Eldridge Mixtrite Stock Feed with Peat-Cattle Feed.		Guarantee	6.00	.60	30.00	38.00	Molasses, alfalfa and cottonseed meal, cottonseed hulls and peat.
528K	Eldridge Mixtrite Stock Feed with Peat-Cattle Feed.		Found.....	7.00	.49	24.00	50.20	

SULPHUR, OKLAHOMA.

1207A	Corn Chops.....	Anderson & Hannah Mill Co.	Guarantee	9.00	3.00	3.50	70.00	
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SULPHUR SPRINGS, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Ex- tract.	Ingredients	Remarks.
1342A	Alfalfa Meal.....	C. C. Crosby.....	Guarantee	14.00	1.60	35.00	38.00	.....
133A	Cottonseed Meal.....	Farmers and Ginners Cot- ton Oil Co.	Guarantee	44.00	7.00	11.00	24.00	.....
50Y	Cottonseed Meal.....		Found....	45.19	6.57	10.00	26.17	.....
133B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	24.00	.....
133C	Cottonseed Meal and Hulls		Guarantee	43.00	7.00	12.00	23.00	.....
133C	Cottonseed Meal and Hulls		Found....	41.94	6.64	11.50	26.61	.....
1609A	Cottonseed Meal.....	Peoples Cotton Oil Co.	Guarantee	45.00	7.00	11.00	20.00	.....
52Y	Cottonseed Meal.....		Found....	43.94	6.86	10.92	25.91	.....
1609B	Cottonseed Cake.....		Guarantee	45.00	7.00	11.00	20.00	.....
51Y	Cottonseed Cake.....	B. T. Tackitt.....	Found....	45.07	6.12	10.58	26.26	.....
1974A	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50	.....

SUNSET, TEXAS.

1276A	Corn Chops.....	S. J. Bennett.....	Guarantee	9.00	3.00	3.50	70.00	.....
1792A	Milo Chops.....	L. C. Brashear.....	Guarantee	10.00	2.50	3.00	70.50	.....
1792B	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....
2165A	Milo Chops.....	H. M. Jackson.....	Guarantee	10.00	2.50	3.00	71.00	.....
2165A	Milo Chops.....		Found....	10.19	2.72	2.53	72.78	.....
1523A	Corn Chops.....	A. F. Smith.....	Guarantee	9.00	3.50	3.50	70.00	.....

SUPERIOR, NEBRASKA.

174B	Corn Chops.....	Filliot & Myers.....	Guarantee	9.00	3.00	3.50	70.00	
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313A	Corn Chops.....	{	Guarantee	9.50	4.00	3.00	70.00
313B	Rice Bran.....		Guarantee	16.00	4.00	9.00	60.00
313C	Wheat Bran.....		Guarantee	15.00	5.00	8.00	50.00	.....
1298A	Hominy Feed.....	{	Guarantee	9.00	6.00	4.00	65.00	.....
1298B	Corn Chops.....		Guarantee	9.50	4.00	3.00	70.00

SUTHERLAND SPRINGS, TEXAS.

1876A	Corn Chops.....	{	Guarantee	9.00	3.50	3.00	70.00
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SWEET SPRINGS, MISSOURI.

1269A	Wheat Shorts.....	{	Guarantee	14.50	3.50	3.50	60.00
1269B	Wheat Bran and Screenings		Guarantee	14.50	3.50	10.00	50.00
1269C	Corn Chops.....		Guarantee	9.00	3.00	3.50	70.00	.....

SWEETWATER, TEXAS.

2060A	Milo Chops.....	{	Guarantee	10.00	2.50	3.00	70.00	.....
2060A	Milo Chops.....		Found.....	11.88	3.02	2.39	70.07	.....
82W	Milo Chops.....		Found.....	11.96	2.95	2.28	71.75	.....
2060B	Milo Head Chops.....	{	Guarantee	9.50	2.25	7.50	65.00	.....
2060B	Milo Head Chops.....		Found.....	12.94	2.92	5.36	65.86	.....
467A	Cottonseed Meal.....	{	Guarantee	44.00	7.00	11.00	23.00	.....
15W	Cottonseed Meal.....		Found.....	42.65	8.85	11.21	25.66	.....
467B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	23.00	.....
467C	Cottonseed Meal and Hulls	{	Guarantee	43.00	7.00	12.00	23.00	.....
467C	Cottonseed Meal and Hulls		Found.....	44.05	8.90	10.70	25.79	.....
41W	Cottonseed Meal and Hulls		Found.....	39.79	10.65	11.93	26.43	.....
467D	Cottonseed Meal and Hulls		Guarantee	43.00	7.00	12.00	23.00	.....
467D	Cottonseed Cake and Hulls	{	Found.....	43.23	10.37	9.22	23.53	.....

SYLVIA, KANSAS.

779A	Corn Chops.....	{	Guarantee	9.00	4.00	3.00	70.00	.....
779B	Wheat Bran.....		Guarantee	14.50	3.50	10.00	54.00	.....
779C	Wheat Shorts.....		Guarantee	14.00	3.00	4.00	62.00	.....

Co.

TAPT, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Extr.	Ingredients.	Remarks.
1415A	Cottonseed Meal.....	Taft Oil and Gin Co.....	Guarantee	44.00	7.00	11.00	22.00	.....
35T	Cottonseed Meal.....		Found....	43.41	7.20	10.82	25.05	.....
1415B	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....
1415B	Corn Chops.....		Found....	10.63	3.99	2.11	69.42	.....
1415C	Mixed Feed.....		Guarantee	10.60	2.85	39.00	33.00	Cottonseed hulls and meal.....	
1415D	Cottonseed Meal and Hulls		Guarantee	35.00	5.00	16.00	23.00	.....
1415D	Cottonseed Meal and Hulls		Found....	37.63	6.28	14.71	27.21	.....
1415E	Cottonseed Cake and Hulls		Guarantee	35.00	5.00	16.00	23.00	.....
1415E	Cottonseed Cake and Hulls		Found....	37.16	5.47	14.75	27.90	.....
1415F	Ground Oats.....		Guarantee	11.00	4.00	10.00	58.00	.....
1415F	Ground Oats.....		Found....	10.42	5.18	13.92	58.04	.....
1415G	Mixed Chops.....		Guarantee	9.75	3.00	4.00	70.00	Corn and milo chops.....	
1415G	Mixed Chops.....		Found....	10.16	3.33	2.35	70.97	.....
1415H	Kafir Chops.....		Guarantee	10.50	2.75	3.00	60.50	.....
1415H	Kafir Chops.....		Found....	9.62	2.99	2.23	71.94	.....
1415I	Milo Chops.....		Guarantee	10.00	2.50	3.00	71.00	.....
1415I	Milo Chops.....		Found....	10.72	2.89	2.46	70.74	.....

TAHOKA, TEXAS.

1990A	Milo Chops.....	Bowers & Vinson.....	Guarantee	10.00	2.75	3.00	70.00	.....
1990B	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....
1990B	Corn Chops.....		Found....	10.75	4.58	2.17	69.72	.....
1990C	Kafir Chops.....		Guarantee	10.00	2.75	2.75	68.00	.....
1990C	Kafir Chops.....	Edwards Brothers.....	Found....	11.17	3.45	2.20	70.79	.....
1495A	Corn Chops.....		Guarantee	9.00	4.00	3.00	70.00	.....
1495B	Milo Chops.....		Guarantee	9.50	2.50	3.00	71.00	.....
1663A	Milo Head Chops.....	W. S. Johnson.....	Guarantee	9.50	2.50	4.00	70.00	.....

2175A	Wheat Bran and Screenings	Tahoka Mill and Elevator Co.	Guarantee	15.00	3.50	9.00	54.00
2175A	Wheat Bran and Screenings		Found....	17.60	3.59	7.05	56.90
2175B	Mixed Feed.....		Guarantee	12.50	3.00	6.00	62.00
2175B	Mixed Feed.....		Found....	13.80	3.15	4.39	65.24

TAMPA, KANSAS.

1423A	Wheat Bran.....	Tampa Milling Co.....	Guarantee	14.50	3.50	10.00	50.00
1423B	Corn Chops.....		Guarantee	9.00	4.00	3.00	70.00
1423C	Wheat Shorts.....		Guarantee	16.70	5.12	5.00	50.00

TAYLOR, TEXAS.

1563A	Cottonseed Meal.....	Citizens Cotton Oil Co.....	Guarantee	44.00	7.00	11.00	24.00
5B	Cottonseed Meal.....		Found....	44.13	7.69	9.72	24.78
1563B	Screened Cottonseed Cake..		Guarantee	44.00	7.00	11.00	24.00
379A	Corn Chops.....	Gossett Brothers.....	Guarantee	9.00	4.00	3.00	70.00
379B	Corn Chops and Corn Bran		Guarantee	9.00	4.00	3.50	70.00
1883A	Prime Cotton Seed Meal..	Planter's Cotton Oil Co...	Guarantee	44.00	7.00	11.00	24.00
1883A	Prime Cotton Seed Meal..		Found....	47.13	7.09	9.45	23.99
682A	Cottonseed Meal.....	Taylor Cotton Oil Co.....	Guarantee	44.00	7.00	11.00	24.00
6B	Cottonseed Meal.....		Found....	41.65	9.92	10.62	24.10
483A	Cottonseed Meal.....	Taylor Cotton Oil Works...	Guarantee	44.00	8.00	9.00	24.00
483B	Mixed Hulls and Meal.....		Guarantee	9.50	3.00	45.00	30.00
37A	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00
37B	Wheat Bran.....		Guarantee	16.50	3.50	9.00	52.00
37C	Wheat Shorts.....		Guarantee	16.00	2.50	3.00	65.00
37D	Wheat Bran and Screenings		Guarantee	16.50	3.50	9.00	52.00
37E	Corn Chops and Corn Bran	Taylor Milling Co.....	Guarantee	9.00	3.50	3.00	70.00
37F	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50
37G	Cracked Wheat Chicken Feed and Screenings.		Guarantee	14.00	2.00	4.00	65.00
37H	Mixed Bran.....		Guarantee	16.50	3.50	9.00	52.00
80R	Mixed Bran.....		Found....	16.19	3.18	5.72	60.53
37H	Mixed Bran.....		Found....	14.94	4.34	8.05	57.42

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
2191A 2191A	Mixed Feed. Mixed Feed.	King Grocery Co.	Guarantee Found.	9.00 12.94	1.10 2.48	46.00 35.42	27.00 35.92	Cottonseed hulls and meal.	
2012A 2012A	Corn Chops. Corn Chops.	Sheffield & McSpadden.	Guarantee Found.	9.00 9.36	3.50 3.95	3.00 2.30	70.00 70.12		
TECUMSEH, OKLAHOMA.									
645A	Cottonseed Cake.	Tecumseh Oil and Cotton Co.	Guarantee	44.00	8.00	7.00	22.00		
TELFERNER, TEXAS.									
1551A	Cold Pressed Cottonseed.	Chas. Hillman.	Guarantee	24.65	9.40	26.68	27.90		
TEMPLE, TEXAS.									
1488A	Corn Chops.	C. W. Barrett & Son.	Guarantee	9.00	3.50	3.00	70.00		
1035A 1035B 1035C 1035D 1035E	Corn Chops. Milo and Corn Chops. Milo Chops. Mixed Chops. Kafir Chops.	Childress Grain Co.	Guarantee Guarantee Guarantee Guarantee Guarantee	9.00 9.00 9.50 9.25 9.05	3.50 3.00 2.50 3.00 2.75	3.00 3.00 3.00 3.00 3.00	70.00 70.00 71.00 70.00 71.00	Corn and kafir chops.	
49A 49B 49C 49D 49E 49F 49G	Corn Chops. Mixed Chops. Mixed Chops. Milo Chops. Kafir Chops. Mixed Chops. Mixed Chops.	A. B. Crouch Grain Co.	Guarantee Guarantee Guarantee Guarantee Guarantee Guarantee Guarantee	9.00 9.00 9.50 9.50 9.50 9.35 9.35	4.00 3.50 3.25 2.50 2.74 3.15 3.15	3.00 3.00 3.00 3.00 3.00 3.00 3.00	70.00 70.00 70.00 71.00 71.00 70.00 70.00	Corn and kafir chops. Corn and milo chops. Corn and milo chops. Corn and milo chops. Corn and kafir chops. Corn and kafir chops. Corn and kafir chops.	

49H	Mixed Feed.....	Guarantee	13.00	3.25	5.75	64.00	Milo chops and wheat bran.
49I	Mixed Feed.....	Guarantee	13.00	3.25	3.75	64.00	Wheat bran and ground milo.
49K	A. B. C. Chicken Feed with Oyster Shell.	Guarantee	9.00	3.00	3.50	70.00	Milo, wheat, corn chops and oyster shell.
49L	Mixed Chops.....	Guarantee	12.00	3.00	3.50	58.00	Corn and milo chops.
1006A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	
679A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	24.00	
9B	Cottonseed Meal.....	Found....	43.56	6.42	10.97	25.85	
679B	Cottonseed Cake.....	Guarantee	44.00	7.00	11.00	24.00	
2024A	Wheat Bran and Screenings	Guarantee	14.50	3.50	9.00	55.00	
2024A	Wheat Bran and Screenings	Found....	18.16	3.94	6.83	54.87	
2024B	Wheat Shorts.....	Guarantee	16.50	3.50	4.50	60.00	
2024B	Wheat Shorts.....	Found....	17.27	3.08	2.63	66.62	
2024C	Corn Chops and Corn Bran	Guarantee	9.00	3.50	3.00	70.00	
2024C	Corn Chops and Corn Bran	Found....	10.10	4.22	2.49	70.89	
2024D	Mixed Bran and Screenings	Guarantee	14.50	3.75	9.50	52.00	Wheat bran, corn bran and wheat screenings.
2024D	Mixed Bran and Screenings	Found....	15.94	4.75	7.11	56.62	
2024E	Mixed Chops.....	Guarantee	9.00	3.00	3.00	70.00	Corn and milo chops.
2024E	Mixed Chops.....	Found....	9.38	3.14	2.24	71.46	
2024F	Mixed Feed.....	Guarantee	12.00	3.00	6.00	62.00	Milo chops and wheat bran.
2024F	Mixed Feed.....	Found....	13.75	3.62	5.87	59.49	
2024G	Milo Chops.....	Guarantee	10.00	2.50	3.00	71.00	
2024G	Milo Chops.....	Found....	9.02	2.90	2.16	71.69	
2024H	Corn Chops.....	Guarantee	9.50	3.50	3.00	70.00	
2024H	Corn Chops.....	Found....	9.69	4.00	2.64	70.94	
2024I	Sunset Chicken Feed.....	Guarantee	11.50	2.60	3.15	68.00	Corn, milo, wheat chops.
2024I	Sunset Chicken Feed.....	Found....	11.63	2.45	2.47	70.16	
2024J	Mixed Chops.....	Guarantee	9.50	3.00	3.00	68.00	Corn and kafir chops.
2024J	Mixed Chops.....	Found....	9.79	3.51	2.09	72.80	
482A	Cottonseed Meal.....	Guarantee	45.00	6.00	11.00	22.00	
482B	Cottonseed Cake.....	Guarantee	45.00	6.00	11.00	22.00	
482C	Cottonseed Meal and Hulls	Guarantee	45.00	6.00	11.00	23.00	
10B	Cottonseed Meal and Hulls	Found....	46.25	7.18	10.14	23.45	
482D	Cottonseed Cake and Hulls	Guarantee	45.00	6.00	11.00	23.00	
42B	Cottonseed Cake and Hulls	Found....	42.66	6.01	12.68	26.30	Excess hulls.

TEMPLE, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Use of Salt and Soda	Ingredients.	Remarks.
452A	Wheat Bran.....	Temple Milling Co.....	Guarantee	15.00	4.50	10.00	50.00	.....
452B	Corn Chops.....		Guarantee	9.50	3.90	2.50	70.00	.....
147A	Corn Chops and Corn Bran	Willig Brothers Flouring Mills.	Guarantee	9.20	3.91	4.09	70.85	.....
147B	Mixed Bran.....		Guarantee	14.00	3.34	9.00	59.00	Wheat and corn bran.	
147C	Corn Chops.....		Guarantee	9.50	3.90	2.50	70.00	.....
147D	Wheat Bran.....		Guarantee	15.10	3.50	8.50	58.00	.....
147E	Wheat Shorts.....		Guarantee	14.50	3.00	3.00	62.00	.....
147E	Mixed Chicken Feed.....		Guarantee	9.50	3.90	2.50	70.00	Small and broken wheat and cracked corn.	

TERRELL, TEXAS.

1617A	Corn Chops.....	G. W. Mathews Grain and Elevator Co.	Guarantee	9.00	4.00	3.00	70.00	.....
1617B	Mixed Chops.....		Guarantee	9.00	3.00	3.00	70.00	Corn and milo chops.	
1617C	Milo Chops.....		Guarantee	9.50	2.50	3.00	70.00	.....
1617D	Milo Chops and Wheat Bran		Guarantee	10.50	2.80	4.75	55.75	.....
63A	Nutrio Mixed Feed.....	Terrell Cotton Oil Co.....	Guarantee	10.30	2.60	43.00	32.50	Cottonseed hulls and meal.	
63B	Cottonseed Meal.....		Guarantee	44.00	7.00	11.00	24.00	.....
4Y	Cottonseed Meal.....		Found....	45.44	6.98	10.09	25.38	.....
86Y	Cottonseed Meal.....		Found....	43.82	6.74	11.44	25.30	.....
87Y	Cottonseed Meal.....		Found....	44.48	6.47	10.45	25.86	.....
37R	Cottonseed Meal.....		Found....	45.23	9.39	9.58	23.95	.....
63C	Cottonseed Meal and Hulls		Guarantee	41.00	6.00	12.00	23.00	.....
63C	Cottonseed Meal and Hulls		Found....	40.26	6.43	13.27	26.44	.....
63D	Cottonseed Meal and Hulls		Guarantee	34.00	6.00	15.00	23.00	.....
63D	Cottonseed Meal and Hulls		Found....	29.66	6.33	17.08	32.84	.....
126A	Runner Corn Chops.....		Guarantee	9.00	4.00	3.00	70.00	.....
126B	Runner Wheat Bran.....		Guarantee	14.50	3.50	10.00	50.00	.....

Adulterated hulls.

Excess hulls.

125C	Banner Stock Food.....	Guarantee	14.50	4.50	10.00	50.50	Wheat bran and shorts, rice bran and corn meal.
125D	Wheat Bran.....	Guarantee	14.50	4.00	10.00	54.00	.....
125E	A. B. C. Stock Feed.....	Guarantee	13.00	3.00	14.00	52.00	Alfalfa meal, wheat bran and corn chops.
125F	Wheat Bran and Screenings	Guarantee	14.00	4.00	10.00	50.00	.....
9S	Wheat Bran and Screenings	Found.	18.09	4.90	6.93	57.81	.....
125H	Corn Chops and Corn Bran	Guarantee	9.50	4.00	3.60	70.00	.....
125I	Banner Chicken Feed with Grit.	Guarantee	10.00	2.50	5.00	70.00	Ground milo, wheat screenings and grit.
125J	Banner Hen Feed with Grit	Guarantee	10.00	2.50	5.00	70.00	Corn chops, milo and grit.
125K	Milo Chops.....	Guarantee	9.50	2.50	3.00	71.00	.....
125L	White Wheat Shorts.....	Guarantee	16.00	3.50	4.50	60.00	.....
125L	White Wheat Shorts.....	Found.	15.88	1.30	.60	73.33	.....

Terrell Milling Co.....

TEXARKANA, ARK.-TEXAS.

364A	Cottonseed Meal.....	Guarantee	44.00	8.00	8.00	24.00	.....
1168A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	.....
1168B	Milo Chops.....	Guarantee	10.00	2.50	3.00	71.00	.....
1168B	Milo Chops.....	Found.	11.50	2.28	1.74	70.52	.....
1144A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	24.00	.....
112Y	Cottonseed Meal.....	Found.	39.88	7.00	11.17	27.75	.....
82A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	.....
82B	Wheat Bran.....	Guarantee	14.00	4.00	10.00	50.00	.....
82C	Cottonseed Meal.....	Guarantee	44.00	8.00	7.00	24.00	.....
82E	Magnolia Stock Feed.....	Guarantee	10.00	3.50	7.50	60.00	Corn chops, oats and wheat bran.
82F	Wheat Bran and Screenings	Guarantee	14.00	4.00	10.00	50.00	.....
82G	Milo Chops.....	Guarantee	10.00	2.50	3.00	71.00	.....
82G	Milo Chops.....	Found.	9.71	2.78	2.19	73.39	.....
82H	Mixed Chops.....	Guarantee	9.50	3.00	3.00	70.00	Milo and corn chops.
82H	Mixed Chops.....	Found.	9.60	3.33	2.25	71.39	.....
152B	Wheat Bran.....	Guarantee	14.18	4.08	7.40	49.00	.....

Lev. Fowler.....

Adulterated hulls.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
1542A	Corn Chops.....	Land Milling Co.	Guarantee	9.00	3.89	2.18	72.63	.....
1542B	L. B. Mixed Feed.....		Guarantee	11.00	3.00	10.00	62.24	Corn and wheat bran, and ground peanut hulls.	
1542C	Ark. Dairy Feed.....		Guarantee	14.00	3.75	12.00	50.00	Corn and wheat bran, cottonseed meal and ground peanut hulls.	
1542D	L. B. Mixed Chops.....		Guarantee	8.00	3.50	2.50	73.00	Corn and kafir chops.....	
1542E	Land Mixed Mill Feed.....		Guarantee	14.50	3.50	9.17	53.24	Wheat and corn bran and bolted rice hulls.	
1542F	Red Ball Mixed Bran.....		Guarantee	14.50	3.50	9.17	53.24	Wheat and corn bran.....	
1542G	Mixed Dairy Feed.....		Guarantee	15.00	4.50	9.17	53.24	Wheat and corn bran, rice bran and hulls.	
1542H	Corn and Milo Chops.....		Guarantee	8.00	3.50	2.50	73.00	.....
1542J	Milo Chops.....		Guarantee	9.00	2.50	3.00	70.00	.....
1542K	Blue Line Mixed Feed.....		Found.....	11.74	2.98	2.63	68.43	.....
1542K	Blue Line Mixed Feed.....	Guarantee	12.50	3.50	6.00	60.00	Wheat bran and kafir chops.....		
1802A	Texarko Mixed Feed.....	Sanders Brothers Co.	Found.	14.56	3.68	5.73	61.01	.....
			Guarantee	9.00	1.50	15.00	55.00	Alfalfa, molasses, corn chop screen- ings and salt.	
1272A	Cottonseed Meal.....		Guarantee	44.00	7.00	11.00	24.00	.....
1272A	Cottonseed Meal.....	Texarkana Cotton Oil and Fertilizer Co.	Found.	43.19	7.64	9.23	26.40	.....
111Y	Cottonseed Meal.....		Found.	43.11	7.80	8.66	27.97	.....
911A	Corn Chops.....	Turner Grain Co.	Guarantee	9.00	4.00	3.00	70.00	.....
911B	Wheat Bran.....		Guarantee	15.00	3.50	10.00	50.00	.....
911C	Wheat Shorts.....		Guarantee	15.50	4.00	4.50	60.00	.....
TEXAS CITY, TEXAS.									
1618A	Milo Chops.....	Texas City Grain and Fuel Co.	Guarantee	9.00	3.00	3.00	68.00	.....

TEXHOMA, OKLAHOMA.

Wheat Bran and Screenings	Patton-Rardin Grain Co.	Guarantee	14.50	3.50	10.00	54.00
Wheat Bran and Screenings		Found. . . .	16.38	3.66	9.86	52.68
Standard Wheat Shorts. . . .		Guarantee	16.50	4.50	5.00	55.30
Standard Wheat Shorts. . . .		Found. . . .	16.00	4.47	5.09	59.04
Corn Chops.	Texhoma Mill and Elevator Co.	Guarantee	9.00	4.00	3.00	70.00
Milo Chops.		Guarantee	9.00	2.50	3.50	70.00

TEXLINE, TEXAS.

Corn Chops.	J. T. Trautham.	Guarantee	9.50	3.50	3.00	70.00
Corn Chops.		Found. . . .	9.15	4.11	2.33	70.64
Milo Chops.		Guarantee	10.00	2.50	3.00	71.00
Milo Chops.		Found. . . .	11.06	2.05	2.84	71.63

THOMAS, OKLAHOMA.

Corn Chops.	Thomas Milling Co.	Guarantee	9.00	4.00	3.00	70.00
Wheat Bran.		Guarantee	14.50	3.50	10.00	50.00
White Wheat Shorts.		Guarantee	17.67	3.13	4.70	61.35
Brown Wheat Shorts.		Guarantee	15.50	3.85	5.00	56.00
Wheat Bran and Screenings		Guarantee	14.50	3.50	10.00	50.00
Wheat Mixed Feed and Screenings.		Guarantee	16.10	3.00	8.16	57.17
Milo Chops.		Guarantee	10.00	2.50	3.00	71.00
Milo Chops.		Found. . . .	11.97	2.66	2.00	69.07
Ground Corn Bran.		Guarantee	9.00	5.00	10.00	63.00
Ground Corn Bran.		Found. . . .	8.83	4.74	7.80	68.52

THORNDALE, TEXAS.

Cottonseed Meal.	Thorndale Oil Mill Co.	Guarantee	44.00	7.00	9.00	24.00
Cottonseed Cake.		Guarantee	44.00	8.00	9.00	24.00

THROCKMORTON, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitrogen- Extr.	Ingredients.	Remarks.
161A	Corn Chops.....	Throckmorton Milling Co.	Guarantee	9.50	3.50	3.00	70.00		
161A	Corn Chops.....		Found....	10.83	4.38	3.13	71.20		
161B	Wheat Bran.....		Guarantee	15.00	3.50	9.00	54.00		
161B	Wheat Bran.....		Found.....	18.08	3.71	6.09	57.42		

TOLAR, TEXAS.

975A	Mixed Feed.....	Tolar Grist Mill.....	Guarantee	11.50	2.50	3.50	70.00	Wheat, corn chops and milo chops..	
975B	Wheat Chops.....		Guarantee	14.00	2.00	4.00	65.00		
975C	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00		
975D	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50		

TOM BEAN, TEXAS.

599A	Corn Chops.....	Tom Bean Grain Co.....	Guarantee	9.00	3.00	3.50	70.00		
057A	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00		
057A	Corn Chops.....	Vincent Brothers.....	Found.....	9.81	4.13	1.97	70.47		

TONGANOXIE, KANSAS.

820A	Wheat Bran.....	Kemper Mill and Elevator Co.	Guarantee	14.75	4.00	9.50	53.75		
820B	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00		

TONEKAWA, OKLAHOMA.

376A	Wheat Bran.....	Tonkawa Mill and Elevator Co.	Guarantee	15.00	3.50	8.00	55.00		
376B	Corn Chops.....		Guarantee	9.54	3.99	2.58	70.98		
376C	Wheat Shorts.....		Guarantee	17.14	4.09	4.28	60.97		
376D	Wheat Mixed Feed.....		Guarantee	16.57	3.88	8.32	64.68	Wheat bran and shorts.....	

TOPEKA, KANSAS.

1234A	Wheat Bran.....	Guarantee	14.50	3.50	10.00	50.00	
1234B	White Wheat Shorts.....	Guarantee	17.50	4.50	5.00	55.00	
1234C	Wheat Mixed Feed and Screenings.....	Guarantee	16.00	3.60	8.50	60.00	Wheat bran, shorts and screenings..
1234C	Wheat Mixed Feed and Screenings.....	Found....	17.50	3.97	7.58	54.06	
1337B	Wheat Middlings.....	Guarantee	16.00	4.00	6.00	53.00	
902A	Winter Wheat Bran.....	Guarantee	15.00	3.50	8.00	55.00	
902B	Winter Wheat Shorts.....	Guarantee	16.00	4.00	5.00	60.00	
902C	Wheat Mixed Feed.....	Guarantee	14.00	4.00	8.00	55.00	Wheat bran and shorts.

TRAVIS, TEXAS.

1248A	Corn Chops.....	Guarantee	9.00	3.00	3.50	70.00	
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TRINITY, TEXAS.

1129A	Mixed Cottonseed Meal and Hulls.....	Guarantee	10.00	2.50	40.00	33.00	
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TULIA, TEXAS.

2064A	Corn Chops.....	Guarantee	9.50	3.50	3.00	70.00	
2064A	Corn Chops.....	Found....	12.03	4.86	2.07	70.17	
2064B	Milo Chops.....	Guarantee	10.00	2.50	3.00	71.00	
2064B	Milo Chops.....	Found....	11.38	2.97	1.90	70.89	
1630A	Kafir Chops.....	Guarantee	9.50	2.75	3.00	71.00	
1630B	Wheat Chops.....	Guarantee	13.00	2.00	5.00	60.00	
1630C	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	
1630D	Milo Chops.....	Guarantee	9.50	2.50	3.00	71.00	
2063A	Milo Chops.....	Guarantee	10.00	2.50	3.00	71.00	
2063A	Milo Chops.....	Found....	11.25	2.66	1.89	71.84	
2063B	Kafir Chops.....	Guarantee	10.50	2.75	3.00	69.50	
2063B	Kafir Chops.....	Found....	11.94	3.31	2.07	70.93	

TULIA, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Ex- tract.	Ingredients.	Remarks.
2011A	Milo Chops.....	Townsend Grain Co.....	Guarantee	10.00	2.50	3.00	70.50		
2011A	Milo Chops.....		Found....	12.48	2.84	2.06	69.62		
TULSA, OKLAHOMA.									
1796A	Corn Chops.....	Rea-Reed Mill and Ele- vator Co.	Guarantee	9.50	3.75	2.50	70.00		
1796B	Wheat Shorts.....		Guarantee	17.00	4.00	4.00	60.00		
1796C	Wheat Mixed Feed.....		Guarantee	16.00	3.25	8.50	52.00	Wheat bran and shorts.	
1796D	Wheat Bran.....		Guarantee	16.00	3.00	8.00	50.00		
1796E	Wheat Mixed Feed and Screenings.		Guarantee	16.00	3.75	8.50	52.00	Wheat bran, shorts and screenings.	
416A	Corn Chops.....	Binding Stevens Grain Co....	Guarantee	8.57	3.26	2.00	74.26		
TURON, KANSAS.									
462A	Corn Chops.....	Turon Mill and Elevator Co.	Guarantee	10.50	2.92	1.50	73.18		
462B	Wheat Bran and Screenings		Guarantee	16.00	3.50	10.00	50.00		
462C	Gray and Brown Shorts....		Guarantee	15.00	3.00	5.00	60.00		
TWIN FALLS, IDAHO.									
1514A	Wheat Bran and Shorts.....	Twin Falls Mill and Elevator Co.	Guarantee	14.50	3.45	6.05	52.00		
TYLER, TEXAS.									
529A	Cottonseed Meal.....	Tyler Cotton Oil Co.....	Guarantee	44.00	7.00	11.00	22.00		Adulterated hulls.
121Y	Cottonseed Meal.....		Found....	38.69	6.21	12.88	28.73		
529H	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	22.00		
529C	Mixed Feed.....		Guarantee	11.00	1.75	42.00	27.00	Cottonseed hulls and meal.	

2000A	White's Mixed Feed.....	White Gin Co.....	{	Guarantee	14.00	3.75	8.00	60.00	Ground peanuts, ear corn chops and milo chops.
2000A	White's Mixed Feed.....		{	Found.....	11.88	9.57	8.94	55.48	

UTOPIA, TEXAS.

1805A	Corn Chops.....	M. C. Boyce.....	{	Guarantee	9.00	3.50	3.00	70.00	
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UVALDE, TEXAS.

1579A	Kafir Head Chops.....	J. P. Liard.....	{	Guarantee	9.00	2.50	7.00	68.00	
1579B	Milo Head Chops.....		{	Guarantee	9.50	2.50	7.50	62.00	
1926A	Corn Chops.....	Uvalde Milling Co.....	{	Guarantee	9.00	3.50	3.00	70.00	

VALLEY CENTER, KANSAS.

1164A	Alfalfa Meal.....	Valley Center Alfalfa Milling Co.....	{	Guarantee	14.00	1.00	29.00	35.00	
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VALLEY MILLS, TEXAS.

2005A	Wheat Bran and Shorts.....	Sleeper Milling and Grain Co.....	{	Guarantee	15.00	3.50	10.00	54.00	
2005A	Wheat Bran and Shorts.....		{	Found.....	17.71	3.76	6.15	58.10	
505A	Cottonseed Meal.....		{	Guarantee	44.00	7.00	11.00	24.00	Adulterated hulls.
32B	Cottonseed Meal.....		{	Found.....	42.69	11.04	10.53	23.24	
505A	Cottonseed Cake.....		{	Guarantee	44.00	7.00	11.00	24.00	Adulterated hulls.
33B	Cottonseed Cake.....		{	Found.....	42.19	6.72	11.61	24.78	
505C	Cottonseed Meal and Hulls	Valley Mills Cotton Oil Co.	{	Guarantee	38.44	7.64	13.82	26.86	
505D	Cottonseed Meal and Hulls		{	Guarantee	43.00	7.00	12.00	23.00	
505D	Cottonseed Meal and Hulls		{	Found.....	41.44	10.75	10.93	25.38	
505E	Cottonseed Cake and Hulls		{	Guarantee	43.00	7.00	12.00	23.00	
505E	Cottonseed Cake and Hulls		{	Found.....	43.41	7.65	10.38	25.06	

VALLEY FALLS, KANSAS.

1591A	Corn Chops.....	Haucks Elevator Co.....	{	Guarantee	9.00	3.50	3.00	70.00	
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VAN ALSTYNE, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Ex- tract.	Ingredients.	Remarks.
1329A	Corn Chops.....	J. W. McWilliams & Co.....	Guarantee	9.00	3.00	3.50	70.00	.....	.....
2018A	Corn Chops.....	Taylor Grain Co.....	Guarantee	9.00	3.50	3.00	70.00	.....	.....
2018A	Corn Chops.....		Found....	9.66	3.85	2.34	71.49	.....	.....
2018B	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.00	.....	.....
2018B	Milo Chops.....		Found....	11.49	2.60	2.15	70.91	.....	.....
428A	Cottonseed Meal.....	Van Alstyne Cotton Oil Co.	Guarantee	44.00	7.00	11.00	24.00	.....	.....
80Y	Cottonseed Meal.....		Found....	47.38	7.71	8.25	22.46	.....	.....
428B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	24.00	.....	.....
428C	Vanco.....		Guarantee	11.00	2.75	38.00	35.00	Cottonseed hulls and meal.	.....
428D	Vanco Mixed Feed.....	Van Alstyne Cotton Oil Co.	Guarantee	12.00	2.40	40.00	30.00	Cottonseed hulls and meal.	.....
428D	Vanco Mixed Feed.....		Found....	15.18	2.74	36.15	32.58	.....	.....
81Y	Vanco Mixed Feed.....		Found....	14.44	3.00	37.61	31.32	.....	.....
428E	Cottonseed Meal and Hulls		Guarantee	41.00	5.00	12.00	22.00	.....	.....
428E	Cottonseed Meal and Hulls	Found....	Found....	41.13	5.91	12.70	27.05	.....	.....
104A	Corn Chops.....	Van Alstyne Roller Mills..	Guarantee	9.00	3.50	3.50	70.00	.....	.....
104B	Wheat Bran.....		Guarantee	17.56	3.86	8.42	54.05	.....	.....

VAN COURT, TEXAS.

1987A	Feterita Head Chops.....	C. E. Stringstun.....	Guarantee	10.00	2.50	8.50	68.00
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VERA, TEXAS.

317A	Corn Chops.....	W. C. Walch.....	Guarantee	11.97	3.82	2.30	72.37
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VERDEN, OKLAHOMA.

1067A	Corn Chops.....	Verden Milling Co.....	Guarantee	9.00	3.50	3.00	70.00
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VERNON, TEXAS.

330A	Corn Chops.....	Kell Milling Co.....	Guarantee	9.00	4.00	3.00	70.00	
330B	Wheat Bran.....		Guarantee	14.50	3.50	10.00	50.00	
330C	Kafir Chops.....		Guarantee	10.00	3.10	3.00	71.00	
330D	Wheat Shorts.....		Guarantee	15.00	3.50	5.00	55.00	
330E	Mixed Corn Chops and Corn Bran.....		Guarantee	8.00	3.50	4.50	65.00	
330F	Milo Chops.....	Kell Milling Co.....	Guarantee	9.50	2.50	3.00	71.00	
330G	Mixed Chops.....		Guarantee	8.50	3.00	3.50	68.00	Kafir and corn chops.....
330H	Wheat Bran and Screenings		Guarantee	14.50	3.50	10.00	50.00	
330I	Mixed Bran.....		Guarantee	14.25	3.75	9.50	56.25	Wheat and corn bran.....
330J	Ground Salt Water Damaged Wheat.....		Guarantee	11.50	1.50	3.25	69.00	
330J	Ground Salt Water Damaged Wheat.....		Found....	15.16	1.50	2.77	65.21	
279A	Corn Chops.....	Sewell Grain and Fuel Co....	Guarantee	9.00	3.00	3.50	70.00	
593A	Cottonseed Meal.....		Guarantee	44.00	7.00	11.00	23.00	
21P	Cottonseed Meal.....		Found....	44.63	6.90	9.17	26.09	
29P	Cottonseed Meal.....		Found....	37.56	10.55	13.70	26.36	Adulterated hulls.
61P	Cottonseed Meal.....		Found....	37.75	9.67	11.88	25.37	Adulterated hulls.
45P	Cottonseed Meal.....	Vernon Cotton Oil Co.....	Found....	42.38	10.77	10.00	25.02	
593B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	22.00	
22P	Cottonseed Cake.....		Found....	36.82	5.16	16.43	28.16	Adulterated hulls.
28P	Cottonseed Cake.....		Found....	44.13	6.62	10.49	25.34	
44P	Cottonseed Cake.....		Found....	38.50	5.89	14.10	27.46	Adulterated hulls.
46P	Cottonseed Cake.....	Vernon Cotton Oil Co.....	Found....	38.25	5.61	14.33	28.81	Adulterated hulls.
55P	Cottonseed Cake.....		Found....	39.25	6.19	12.91	28.38	Adulterated hulls.
60P	Cottonseed Cake.....		Found....	40.38	6.10	11.89	27.38	Adulterated hulls.
593C	Cottonseed Meal and Hulls		Guarantee	40.00	6.00	15.00	22.00	
593C	Cottonseed Meal and Hulls		Found....	44.73	6.99	9.71	26.30	
593D	Cottonseed Cake and Hulls	Vernon Cotton Oil Co.....	Guarantee	40.00	6.00	15.00	22.00	
593D	Cottonseed Cake and Hulls		Found....	42.25	7.23	10.42	27.68	
593E	Cottonseed Meal and Hulls		Guarantee	36.00	7.00	15.00	22.00	

VICTORIA, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
309A	Cottonseed Meal.	Victoria Manufacturing Co.	Guarantee	44.00	7.00	11.00	24.00	.....	.....
52T	Cottonseed Meal.		Found.	47.44	7.83	7.46	25.13	.....	.....
309B	Cottonseed Cake.		Guarantee	44.00	7.00	11.00	24.00	.....	.....
309C	Mixed Feed....		Guarantee	10.00	2.50	40.00	30.00	Cottonseed hulls and meal.	.....
309D	Mixed Feed....		Guarantee	10.50	1.50	40.00	32.50	Cottonseed hulls and meal.	.....
53T	Mixed Feed....		Found.	10.50	1.99	42.31	31.15	.....	.....
309E	Mixed Feed....	Victoria Milling Co.	Guarantee	10.50	1.50	38.00	20.00	Cottonseed hulls and meal.	.....
309F	Mixed Feed....		Guarantee	9.50	1.25	46.50	27.00	Cottonseed hulls and meal.	.....
1979A	Milo Chops....		Guarantee	9.00	2.50	3.50	65.00	.....	.....
1979B	Corn Chops....	Victoria Milling Co.	Guarantee	9.00	3.50	3.00	70.00	.....	.....
1979B	Corn Chops....		Found.	7.98	4.15	2.10	70.48	.....	.....

VOS, TEXAS.

1868A	Milo Head Chops.	A. B. Strickland.	Guarantee	9.50	2.25	7.50	65.00
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WACO, TEXAS.

1958A	Corn Chops....	Anchor Mills.....	Guarantee	9.00	3.50	3.00	70.00
1958B	Milo Chops....		Guarantee	10.00	2.50	3.00	70.50
1958C	Mixed Feed....		Guarantee	10.00	2.50	3.00	68.00	Wheat, corn chops and milo chops.	.....
1958D	Milo and Corn Chops.		Guarantee	9.50	3.00	3.00	70.00	.....	.....
1958E	Wheat Shorts.....		Guarantee	17.00	3.50	4.50	58.00	.....	.....
1958F	Wheat Bran and Screenings		Guarantee	15.00	3.50	10.00	55.00	.....	.....
1958G	Corn Bran.....	Anchor Mills.....	Guarantee	9.00	5.00	10.00	63.00	.....	.....
1958H	Wheat and Corn Bran....		Found.	10.00	8.13	12.05	57.55	.....	.....
1958I	Wheat and Corn Bran....		Guarantee	14.50	3.50	9.00	54.00	.....	.....
1958I	Wheat and Corn Bran....		Found.	16.46	5.09	7.37	56.42	.....	.....

WACO, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Free Extract.	Ingredients	Remarks.
1826A	Live Oak Hen Food.....	Rush Park Seed Co.....	Guarantee	9.00	3.50	3.00	70.00	Wheat, corn, barley, rye, kafir, milo, sunflower seed and wheat screen- ings.	
1826B	Live Oak Chick Feed.....		Guarantee	9.00	3.50	3.00	70.00	Wheat, corn, kafir, milo, millet, and re-cleaned wheat screenings.	
256A	Corn Chops.....	Seley-Early Grain Co.....	Guarantee	9.00	3.00	3.00	70.00	.....
256B	Mixed Chops.....		Guarantee	9.00	3.50	3.00	70.00	Corn and kafir chops.....	
256C	Kafir Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....
256D	Milo Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....
256E	Mixed Feed.....		Guarantee	8.20	2.14	2.62	72.00	Kafir and cane seed chops.....	
1844A	Mixed Chicken Feed with Grit	Smith Brothers.....	Guarantee	11.00	3.30	2.65	65.00	Wheat, kafir, millet, corn chops, sun- flower seed, grit and bone.	
2017A	Chicken Feed with Charcoal	J. G. Smith Grain Co.....	Guarantee	10.00	2.50	4.00	60.00	Milo chops, wheat, corn chops, charcoal, shell and beef.	
2017A	Chicken Feed with Charcoal and Shell.		Found.....	12.20	2.82	3.66	65.62	.....
2017B	Milo Chops.....		Guarantee	10.00	2.50	3.50	70.50	.....
2017B	Milo Chops.....		Found.....	10.72	2.74	2.21	73.66	.....
2017C	Corn Chops.....		Guarantee	9.00	3.00	3.50	70.00	.....
2017C	Corn Chops.....		Found.....	10.00	3.67	2.30	71.66	.....
2017C	Corn Chops.....		Found.....	10.22	3.53	2.62	70.09	.....
2017D	Corn and Milo Chops.....		Guarantee	9.75	3.00	3.00	70.50	.....
2017D	Corn and Milo Chops.....		Found.....	9.69	3.45	2.22	70.02	.....
2017E	Mixed Feed.....		Guarantee	11.00	3.00	8.00	68.00	Wheat bran, shorts and milo meal.	
2017E	Mixed Feed.....		Found.....	11.38	2.97	3.42	66.35	.....
464A	Cottonseed Meal.....	Waco Cotton Oil Mill Co...	Guarantee	45.00	6.00	11.00	22.00	.....
13B	Cottonseed Meal.....		Found.....	45.50	7.55	9.87	24.00	.....

484B	Cottonseed Cake.....	Guarantee	45.00	6.00	11.00	22.00	
31B	Cottonseed Cake.....	Found....	43.92	6.63	11.26	24.50	
235A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00	
235B	Wheat Bran and Screenings	Guarantee	14.50	3.00	10.00	55.00	
10S	Wheat Bran and Screenings	Found....	17.88	3.93	7.37	56.34	
235C	Wheat Shorts.....	Guarantee	15.00	4.00	5.00	60.00	
5R	Wheat Shorts.....	Found....	17.35	4.42	4.73	58.96	
235D	Corn and Kafir Chops.....	Guarantee	9.00	3.50	3.00	70.00	
235F	Kafir Chops.....	Guarantee	9.00	3.00	3.00	70.00	
235F	Belle of Waco Poultry Feed.	Guarantee	9.00	3.50	3.00	70.00	Wheat, cracked corn, kafir and milo.
23G	Wheat Bran Screenings and Chaff.	Guarantee	14.50	3.50	12.00	55.00	
235H	Mixed Bran and Screenings	Guarantee	13.00	3.00	10.00	56.00	Wheat bran, corn bran and screenings.
235I	Mixed Feed.....	Guarantee	12.50	3.00	6.00	62.50	Ground milo and wheat bran.
235I	Mixed Feed.....	Found....	11.99	3.22	3.61	68.00	
1825A	Live Oak Chick Feed.....	Guarantee	9.00	3.50	3.00	70.00	Corn, kafir, milo chops, wheat and millet.
1825B	Live Oak Hen Food.....	Guarantee	9.00	3.50	3.00	70.00	Corn chops, wheat, barley, milo, kafir and sunflower seed.
WAGONER, OKLAHOMA.							
1420A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	
WALLER, TEXAS.							
1028A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	
WALNUT SPRINGS, TEXAS.							
1466A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	
WAMBA, TEXAS.							
2085A	Corn Chops.....	Guarantee	9.50	3.50	3.00	70.00	
2085A	Corn Chops.....	Found....	8.89	4.10	2.12	71.03	

Waco Mill and Elevator Co.

Mel L. Webster Co.

WARING, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Grade Fiber.	Nitrogen-Free Extract.	Ingredients.	Remarks.
879A	Corn Chops.	Aug. Offer.	Guarantee	9.00	4.00	3.00	70.00		

WASHINGTON, TEXAS.

802A	Corn Chops.	Henry Wehmeyer.	Guarantee	9.00	4.00	3.00	70.00		
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WATERLOO, ILLINOIS.

456A	Wheat Bran.	Waterloo Milling Co.	Guarantee	15.00	4.00	8.25	50.00		
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WATER VALLEY, TEXAS.

1943A	Milo Head Chops.	A. J. Harden.	Guarantee	9.50	2.25	7.50	65.00		
1963A	Milo Head Chops.	B. F. Rainey.	Guarantee	9.50	2.25	7.50	65.00		

WATONGO, OKLAHOMA.

1024A	Corn Chops.	Farmers Mill and Elevator Co.	Guarantee	9.00	3.50	3.00	70.00		
1024C	Wheat Shorts.		Guarantee	16.00	4.00	3.50	65.00		
1128A	Corn Chops.	Marshall Brothers.	Guarantee	9.00	3.50	3.00	70.00		

WAUKEGAN, ILLINOIS.

1851A	Blatchford's Calf Meal.		Guarantee	24.00	5.00	6.75	45.00	Locust bean meal, unpressed flax seed, wheat flour, barley meal, ground peas and beans, old process oil meal, coconut meal, coconut shell meal, recleaned	
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1851B	Blatchford's Hog Ration...	Guarantee	15.25	7.50	6.75	55.75	cottonseed meal, foenugrueek, dried milk, anise and salt.
1851C	Blatchford's Pig Meal.....	Guarantee	18.00	5.00	7.00	53.00	Barley, oil, rice, locust bean, cocoa- nut shell, bean meal and wheat flour.
1851D	Blatchford's Milk Mash.	Guarantee	20.00	4.00	7.50	46.00	Linseed oil, oats, barley, re-cleaned cottonseed, corn, coco shell meal, wheat flour, crushed flax seed, foenugrueek and salt.
1851E	Blatchford's Fill the Basket Egg Mash.	Guarantee	19.00	4.00	10.00	50.75	Locust bean, barley, old process oil, coco and shell, re-cleaned cotton- seed, oat meal, unpressed flax seed, wheat flour, ground beans and peas, foenugrueek, dried milk, anise and salt, also barley, bone, corn, wheat middlings, beef scraps and fish.

Blatchford Calf Meal
Factory.

WAXAHACHIE, TEXAS.

1741A	Corn Chops.....	Guarantee	9.50	3.50	3.00	70.00	
1741A	Corn Chops.....	Found....	9.81	4.36	2.53	69.73	
1741B	Hominy Feed.....	Guarantee	9.00	6.00	7.00	60.00	
1741B	Hominy Feed.....	Found....	9.63	6.67	9.28	62.31	
1787B	Cold Pressed Cottonseed...	Guarantee	26.00	6.00	26.00	28.00	
1787B	Cold Pressed Cottonseed...	Found....	26.75	6.50	21.96	31.81	
148Y	Cold Pressed Cottonseed...	Found....	23.10	8.27	21.34	35.42	
116T	Cold Pressed Cottonseed...	Found....	23.81	8.28	20.75	35.06	
3R	Cold Pressed Cottonseed...	Found....	25.67	9.77	21.81	30.37	

C. C. Milling Co.

Farmers Gin and Milling
Co.

WAXAHACHIE, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen- Extr.	Ingredients.	Remarks.
2013A	Mixed Chicken Feed.....	J. J. McQuatters & Son....	Guarantee	9.00	3.25	3.00	70.00	Corn, milo, kafir, wheat, cane seed, corn chops.	
2013A	Mixed Chicken Feed.....		Found.....	10.52	3.34	2.27	71.24		
95A	Cottonseed Meal and Hulls	Planters Cotton Oil Co.	Guarantee	35.00	7.00	19.00	22.00		
95A	Cottonseed Meal and Hulls		Found.....	38.63	6.24	13.38	28.29		
95C	Cottonseed Cake and Hulls		Guarantee	30.00	7.00	24.00	24.00		
95C	Cottonseed Cake and Hulls		Found.....	28.07	7.04	16.89	33.51		
95D	Planco Mixed Feed.....		Guarantee	10.00	2.00	45.00	30.00	Cottonseed hulls and meal	
18B	Planco Mixed Feed.....		Found.....	11.19	1.49	41.92	32.56		
95E	Cottonseed Meal.....	Planters Cotton Oil Co.	Guarantee	44.00	7.00	11.00	23.00		
95F	Cottonseed Meal.....		Found.....	40.07	5.56	13.92	26.27		
20B	Cottonseed Cake.....		Guarantee	13.03	3.08	36.18	34.36	Cottonseed hulls and meal and salt	Adulterated hulls.
95G	Planco Horse and Mule Feed		Guarantee	36.00	6.00	20.00	23.00		
95H	Whole Pressed Peanut Meal		Found.....	36.42	9.19	21.78	19.62		
536A	Cottonseed Meal.....	Southland Cotton Oil Co. . .	Guarantee	45.00	7.00	9.00	23.00		Adulterated hulls. Adulterated hulls.
10B	Cottonseed Meal.....		Found.....	44.13	6.05	12.01	24.60		
43B	Cottonseed Meal.....		Found.....	39.44	8.14	12.74	26.02		
536B	Cottonseed Meal and Hulls		Guarantee	35.00	7.00	19.00	22.00		
536C	Cottonseed Meal and Hulls		Found.....	38.63	11.69	12.33	25.68		
536C	Cottonseed Cake and Hulls		Guarantee	35.00	7.00	19.00	22.00		
536C	Cottonseed Cake and Hulls	Shive & Keys Mill and Re- vapor Co.	Found.....	38.26	6.00	13.67	27.85		
536D	Cottonseed Cake and Hulls		Guarantee	41.00	6.00	15.00	25.00		
536D	Cottonseed Meal and Hulls		Found.....	40.42	7.21	11.58	27.03		
536E	Cottonseed Meal and Hulls		Guarantee	30.00	7.00	24.00	24.00		
312A	Corn Chops.....		Guarantee	10.21	4.68	2.75	72.45		

WEATHERFORD, TEXAS.

691A	Corn Chops.....	Guarantee	9.25	3.95	3.00	69.70	
691B	Unbolted Milo Chops.....	Guarantee	9.00	3.00	2.25	70.00	
691C	Wheat Chops.....	Guarantee	14.00	2.00	4.05	65.00	
691D	Mixed Feed.....	Guarantee	11.00	4.00	3.00	65.00	Wheat bran and ground milo.....
691E	Milo Head Chops.....	Guarantee	8.05	2.05	8.00	65.00	
691F	Mixed Chicken Feed.....	Guarantee	9.00	3.05	3.00	70.00	
691F	Mixed Chicken Feed.....	Pound.....	11.25	3.09	3.17	70.08	
579A	Corn Chops.....	Guarantee	9.29	3.47	2.74	70.34	
579B	Wheat Bran.....	Guarantee	16.80	3.74	10.59	51.59	
579C	Kafir Chops.....	Guarantee	9.00	2.50	3.00	70.00	
184A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00	
184B	Wheat Bran.....	Guarantee	16.00	4.00	8.40	50.00	
184C	Kafir Chops and Wheat Bran.....	Guarantee	10.75	3.00	4.00	65.00	
184D	Wheat Bran.....	Guarantee	13.00	3.50	9.00	60.00	
184F	Milo Head Chops.....	Guarantee	9.00	3.00	2.75	70.00	
184E	Unbolted Kafir Meal.....	Guarantee	9.00	3.00	2.25	70.00	
184G	Ground Milo and Wheat Bran.....	Guarantee	11.00	3.00	4.00	65.00	
184H	Mixed Feed.....	Guarantee	15.00	3.50	9.00	60.00	Wheat bran, corn bran and screenings.
184I	Wheat Shorts.....	Guarantee	15.00	3.00	5.00	60.00	
184J	Wheat Bran and Screenings.....	Guarantee	16.00	4.00	8.40	50.00	
75P	Wheat Bran and Screenings.....	Guarantee	17.44	4.06	8.41	54.82	
184K	Poultry Food.....	Guarantee	10.50	2.75	2.50	70.50	Wheat and corn chops.....
259A	Corn Chops.....	Guarantee	9.19	3.84	3.11	69.70	
259B	Dorsey Mixed Feed.....	Guarantee	11.50	4.00	8.00	60.00	Wheat, oats and corn.....
259C	Mixed Feed.....	Guarantee	12.00	4.00	7.00	60.00	Wheat bran and corn.....
259D	Alfalfa.....	Guarantee	12.00	3.00	15.00	50.00	Alfalfa, corn chops and wheat bran.....
259E	Ground Wheat.....	Guarantee	12.00	2.00	2.00	71.00	
259F	Milo Head Chops.....	Guarantee	9.50	2.50	7.50	62.00	
259G	Milo Chops.....	Guarantee	9.00	3.00	2.75	70.00	
259H	Kafir Chops.....	Guarantee	9.50	2.75	3.00	71.00	
259I	Mixed Feed.....	Guarantee	14.50	3.60	10.00	52.00	Wheat bran, and kafir chops.....
259J	Corn and Wheat Chops.....	Guarantee	10.25	2.90	2.75	70.00	
259K	Good Chicken Feed.....	Guarantee	9.19	3.84	3.11	59.70	Milo, wheat and corn chops.....

WEATHERFORD, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Ex- tract.	Ingredients.	Remarks.
259J.	Jersey Mixed Feed.....	Dorsey Grain Co.—Cont.	Guarantee	9.61	.72	12.92	52.73	Alfalfa meal, milo chops, wheat bran and molasses.	
259M	Thoroughbred Mixed Feed		Guarantee	9.40	.70	16.47	48.93	Alfalfa meal, corn chops, wheat bran and molasses.	
1944A	Corn Chops.....	Hambleton Custom Mill...	Guarantee	9.00	3.50	3.00	70.00	.....
1944B	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50	.....
1353A	Corn Chops.....	H. L. Harley.....	Guarantee	9.00	3.00	3.50	70.00	.....
1353B	Ear Corn Chops.....		Guarantee	8.50	2.50	8.00	65.00	.....
631A	Cottonseed Meal.....	Planters Oil Co.....	Guarantee	44.00	7.00	11.00	24.00	.....	Adulterated hulls.
17P	Cottonseed Meal.....		Found....	39.88	8.10	13.38	26.52	.....
18P	Cottonseed Meal.....		Found....	44.38	7.86	10.52	24.73	.....
76P	Cottonseed Meal.....		Found....	44.82	8.90	8.76	23.90	.....
631B	Cottonseed Meal.....		Guarantee	44.00	7.00	11.00	24.00	.....
631C	Poco Mixed Feed.....	J. A. Rentz.....	Guarantee	11.00	3.00	34.00	24.00	Cottonseed hulls and meal.....	
2200A	Wheat Bran.....		Guarantee	15.00	3.50	10.00	55.00	.....
2200A	Wheat Bran.....		Found....	16.69	3.90	6.50	58.64	.....

WEATHERFORD, OKLAHOMA.

138A	Corn Chops.....	Weatherford Milling Co.	Guarantee	9.60	3.90	2.52	71.70	.....
138B	Wheat Bran.....		Guarantee	16.20	3.73	8.42	54.05	.....
138C	Mixed Feed.....		Guarantee	16.57	3.88	8.42	54.68	Wheat bran and shorts.....	

WEBB CITY, MISSOURI.

1492A	Corn Chops.....	Ball and Gunning Milling Co.	Guarantee	9.00	3.50	3.50	70.00	.....
1492B	Golden Gate Mixed Feed...		Guarantee	15.00	3.50	8.00	55.00	Wheat bran, corn bran and wheat screenings.	

968A	Wheat Bran and Shorts.	} Boyd Gunning Milling Co. {	Guarantee	15.00	3.50	8.00	55.00
968B	Corn Chops.		Guarantee	9.00	3.50	3.50	70.00

WEIMER, TEXAS.

215A	Cottonseed Meal.	} Hillje Brothers. {	Guarantee	45.00	6.00	11.00	24.00
19T	Cottonseed Meal.		Found.	48.09	8.33	6.91	23.86
215B	Cottonseed Cake.		Guarantee	45.00	6.00	11.00	24.00

WEINERT, TEXAS.

1920A	Milo Chops.	Ferris Ranch Gin.	Guarantee	10.00	2.50	3.00	70.50
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WEIR, TEXAS.

900A	Corn Chops.	Collin & Morton.	Guarantee	9.00	4.00	3.00	70.00
1473A	Corn Chops.	Jackson & Mitchell.	Guarantee	9.00	3.50	3.00	70.00

WELLINGTON, KANSAS.

524A	Wheat Bran.	} Aetna Mill and Elevator Co. {	Guarantee	16.50	4.00	10.00	52.00
524B	Wheat Shorts.		Guarantee	18.00	4.50	5.00	52.00
524C	Corn Chops.		Guarantee	9.00	3.00	3.00	70.00
524D	Mixed Corn Feed.		Guarantee	9.00	3.00	4.75	69.00
524E	Wheat Bran and Screenings		Guarantee	14.50	3.50	10.00	50.00
524G	Wheat Mixed Feed.		Guarantee	17.50	4.20	8.50	54.00
543A	Corn Chops.	} Hunter Milling Co. {	Guarantee	9.00	3.00	3.00	71.00
543B	Wheat Bran.		Guarantee	15.00	3.00	10.00	52.00
543C	Wheat Mixed Feed.		Guarantee	16.00	3.00	9.00	52.00
543D	Wheat Shorts.		Guarantee	16.00	4.00	5.00	53.00
543E	Wheat Mixed Feed and Screenings.		Guarantee	16.00	3.00	9.00	52.00
543F	Wheat Shorts and Ground Screenings.		Guarantee	16.00	4.00	9.00	53.00

WELLINGTON, KANSAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen- Free Extr.	Ingredients.	Remarks.
227A	Corn Chops.....	Wellington Milling and Elevator Co.	Guarantee	9.00	3.50	3.00	70.00	.....	.....
227C	Wheat Mixed Feed and Screenings.		Guarantee	16.00	3.50	8.50	50.00	Wheat bran, shorts and screenings.	.....
227D	Standard Wheat Shorts....		Guarantee	16.00	3.50	5.50	55.00	.....	.....
227E	Wheat Bran and Screenings		Guarantee	14.50	3.50	10.00	50.00	.....	.....
227G									

WELLINGTON, MISSOURI.

1351A	Corn Chops.....	Wellington Milling Co....	Guarantee	9.00	3.50	3.50	70.00	.....	.....
1351B	Wheat Shorts.....		Guarantee	15.50	3.50	5.00	60.00	.....	.....
1351C	Wheat Bran.....		Guarantee	14.50	3.50	10.00	50.00	.....	.....

WELLINGTON, TEXAS.

629A	Corn Chops.....	J. D. Thomas.....	Guarantee	9.00	3.00	3.00	70.00	.....	.....
1823A	Wheat Chops.....		Guarantee	12.00	2.00	2.00	71.00	.....	.....
1823B	Corn Chops.....		Guarantee	10.00	4.00	2.00	70.00	.....	.....
1823C	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50	.....	.....
1823D	Mixed Cow Feed.....		Guarantee	18.00	15.00	17.00	34.00	Corn bran and ground cottonseed feed.	.....
1823D	Mixed Cow Feed.....		Found	17.59	14.03	20.46	35.84	.....	.....
1505A	Corn Chops.....	Wellington Milling Co....	Guarantee	9.00	3.50	3.00	70.00	.....	.....
1505B	Kafir Chops.....		Guarantee	9.50	2.75	3.00	71.00	.....	.....
1505C	Milo Chops.....		Guarantee	9.50	2.50	3.00	71.00	.....	.....
1505D	Mixed Feed.....		Guarantee	10.50	6.50	13.00	50.00	Ear corn chops and ground cotton seed.	.....
1505E	Wheat Chops.....		Guarantee	13.00	2.00	5.00	60.00	.....	.....
1505F	Mixed Feed.....		Guarantee	11.50	2.75	8.75	57.50	Wheat and oat chops.	.....

1000A	Ear Corn Chops.....	John Winney.....	Guarantee	8.00	3.00	6.00	65.00
1000B	Milo Head Chops.....		Guarantee	8.50	2.50	6.00	65.00
1000C	Cottonseed Chops.....		Guarantee	17.00	15.00	20.00	25.00

WEST, TEXAS.

418A	Corn Chops.....	Denton Grain Co.....	Guarantee	8.91	3.82	3.00	70.00
447A	Cottonseed Meal.....	West Cotton Oil Mill.....	Guarantee	45.00	6.00	11.00	22.00
71B	Cottonseed Meal.....		Found.....	46.63	6.72	9.47	24.27
447B	Cottonseed Cake.....		Guarantee	45.00	6.00	11.00	22.00

WEST PLAINS, MISSOURI.

1700A	Corn Chops.....	Pease-Moore Milling Co...	Guarantee	9.00	3.00	3.50	70.00
1700B	Wheat Bran.....		Guarantee	15.05	3.02	8.50	58.21
1700C	Wheat Shorts.....		Guarantee	15.00	3.00	4.68	65.35

WHARTON, TEXAS.

496A	Cottonseed Meal.....	Peoples Oil and Cotton Co. {	Guarantee	44.00	7.00	8.00	24.00
496B	Cottonseed Cake.....		Guarantee	44.00	7.00	8.00	24.00
675B	Corn Bran.....	Star Roller Mills.....	Guarantee	8.00	8.00	12.00	60.00
1686A	Ear Corn Chops.....	Superior Mills.....	Guarantee	8.00	3.00	8.00	65.00
1686B	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00
380A	Corn Chops.....	Wharton Milling Co.....	Guarantee	9.00	4.00	3.00	70.00
380B	Corn Bran.....		Guarantee	9.00	5.00	12.00	53.00

WHEELER, TEXAS.

741A	Corn Chops.....	R. B. Rogers.....	Guarantee	9.00	4.00	3.00	70.00
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WHITESBORO, TEXAS.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitro- gen Ex- tract.	Ingredients.	Remarks.
1779A	Wheat Bran.....	Robnett-Buchanan Mill- ing Co.	Guarantee	14.50	3.50	10.00	60.00	.....
1779B	Corn Chops.....		Guarantee	9.00	3.50	3.00	70.00	.....
1779C	Wheat Shorts.....		Guarantee	17.00	3.50	4.50	60.00	.....
1779D	Milo Chops.....		Guarantee	10.00	2.50	3.00	70.50	.....
1779E	Mixed Bran and Screenings		Guarantee	14.00	3.50	10.00	50.00	Wheat bran, corn bran and screen- ings.	
1779E	Mixed Bran and Screenings		Found.....	17.21	3.13	6.44	58.82	.....
1779F	Corn Chops and Corn Bran		Guarantee	9.50	3.50	3.00	70.00	.....
1779F	Corn Chops and Corn Bran		Found.....	9.81	4.34	2.83	69.49	.....
1779G	Wheat Bran and Screenings		Guarantee	15.00	3.50	9.00	54.00	.....
1779G	Wheat Bran and Screenings		Found.....	18.95	3.22	5.05	57.97	.....
619A	Cottonseed Meal.....	Whitesboro Cotton Oil Co.	Guarantee	44.00	7.00	11.00	24.00	.....
105Y	Cottonseed Meal.....		Found.....	45.06	7.98	9.20	24.54	.....
619B	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	22.00	.....
104Y	Cottonseed Cake.....		Found.....	44.54	7.44	9.48	24.10	.....

WHITEWRIGHT, TEXAS.

241A	Corn Chops.....	{	Guarantee	9.00	4.00	3.00	70.00	.....
241B	Wheat Bran.....		Guarantee	14.50	3.50	10.00	50.00	.....
241C	Wheat Shorts.....		Guarantee	15.00	3.50	5.00	60.00	.....
241E	Mixed Feed.....		Guarantee	15.00	3.50	7.00	58.00	Wheat bran and milo chops.....	
241G	Wheat Shorts and Kafir Mixed.		Guarantee	13.00	3.00	4.25	63.00	.....
241H	Mixed Feed.....	{	Guarantee	12.50	3.00	8.00	59.00	Wheat bran and milo chops.....	
241I	Mixed Feed.....		Guarantee	12.00	3.80	10.40	55.00	Wheat and corn bran.....	
241J	Corn Chops and Corn Bran		Guarantee	9.00	3.00	3.50	69.00	.....
241K	Mixed Bran and Screenings		Guarantee	14.50	3.00	9.50	55.00	Corn bran, wheat bran and screen- ings.	

Beatrice Milling Co.....

142Y	Mixed Bran and Screenings	Found . . .	14.69	4.89	8.05	57.03	
241L	Wheat Bran and Screenings	Guarantee	14.50	3.50	11.00	52.00	
241M	Milo Chops and Corn Bran.	Guarantee	10.00	3.00	70.00		
241N	Milo and Corn Chops and Corn Bran.	Guarantee	9.00	3.00	3.00	70.00	
241O	Mixed Feed.	Guarantee	12.00	2.25	6.00	62.25	Corn bran, wheat screenings, wheat bran and milo chops.
241P	Premium Little Chick Food	Guarantee	10.00	2.50	3.10	69.00	Milo, kafir and corn chops, and wheat screenings.
1018A	Corn Chops.	Guarantee	9.00	3.50	3.00	70.00	
43A	Cottonseed Meal.	Guarantee	44.00	7.00	11.00	24.00	
43B	Cottonseed Cake.	Guarantee	44.00	7.00	11.00	24.00	
43C	Cottonseed Meal and Hulls	Guarantee	43.00	7.00	11.50	23.00	
24A	Wheat Shorts.	Guarantee	16.00	3.50	5.00	62.00	
24A	Wheat Shorts.	Found . . .	17.50	2.66	1.42	67.23	
24B	Wheat Bran and Screenings	Guarantee	14.50	3.50	10.00	53.00	
24B	Wheat Bran and Screenings	Found . . .	18.64	4.88	9.08	51.51	
59R	Wheat Bran and Screenings	Found . . .	17.30	4.20	8.14	52.25	

WHITNEY, TEXAS.

1206A	Corn Chops.	Guarantee	9.50	3.50	3.50	70.00	
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WICHITA, KANSAS.

935A	Acme Dairy Feed.	Guarantee	15.50	2.75	17.00	48.50	Alfalfa and cottonseed meal, corn chops, wheat bran and salt.
935B	Acme Horse Feed.	Guarantee	13.50	2.75	14.50	54.00	Alfalfa and linseed meal, wheat bran, shorts, corn chops and salt.
935C	Alfalfa Meal.	Guarantee	13.50	1.50	25.00	36.00	
935D	Corn Chops.	Guarantee	9.00	3.00	3.50	65.00	
935F	Wheat Bran.	Guarantee	15.50	3.50	8.50	55.00	
935G	Gray Shorts.	Guarantee	15.50	4.00	5.00	60.00	
1548A	Wheat Bran.	Guarantee	14.50	3.00	10.00	51.00	
1548B	Wheat Shorts.	Guarantee	15.00	3.50	5.00	60.00	
1548C	Wheat Mixed Feed.	Guarantee	14.50	3.50	10.00	51.00	Wheat bran and shorts.

WICHITA, KANSAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen- Extract.	Ingredients.	Remarks.
1548D	Corn Chops.....	H. W. Gorvin—Cont'd. . .	Guarantee	9.00	3.00	3.50	70.00	.....
1548E	Wheat Bran and Screenings		Guarantee	14.00	3.00	10.00	51.00	.....
130A	Wheat Bran.....	Gorvin Flour and Grain Co	Guarantee	14.50	3.00	10.00	51.00	.....
130C	Corn Chops.....		Guarantee	9.00	3.00	3.50	70.00	.....
130D	Wheat Shorts.....		Guarantee	15.00	3.50	5.00	60.00	.....
130E	Kafir Chops.....		Guarantee	9.00	3.00	3.50	70.00	.....
130F	Wheat Shorts and Screenings		Guarantee	15.00	3.00	5.00	60.00	.....
130G	Wheat Bran and Screenings		Guarantee	14.50	3.00	10.00	51.00	.....
130H	Wheat Mixed Feed and Screenings.		Guarantee	14.50	3.50	10.00	51.00	Wheat bran, shorts and screenings.	
1977A	Wheat Bran and Screenings	Grain Products Co.	Guarantee	14.50	3.00	10.00	55.00	.....
1977B	Wheat Mixed Feed and Screenings.		Guarantee	14.50	3.50	10.00	55.00	Wheat bran, shorts and screenings.	
1977C	Wheat Shorts.....		Guarantee	15.00	3.50	5.00	60.00	.....
143Y	Wheat Shorts.....		Found. . .	18.72	4.73	5.21	56.00	.....
610A	Wheat Bran.....	Imboden Milling Co.	Guarantee	14.79	5.30	10.00	54.36	.....
610B	Corn Chops.....		Guarantee	9.00	3.50	3.50	70.00	.....
610C	Wheat Mixed Feed.....		Guarantee	14.50	3.50	10.00	50.00	Wheat bran and shorts.	
179A	Wheat Bran.....	Kansas Milling Co.	Guarantee	15.50	3.50	8.50	53.00	.....
179B	White Wheat Shorts.....		Guarantee	17.00	4.00	3.00	57.00	.....
179C	Brown Wheat Shorts.....		Guarantee	16.50	4.00	5.00	56.00	.....
179D	Corn Chops.....		Guarantee	9.00	3.00	3.00	71.50	.....
179E	Alfalfa Chops.....		Guarantee	15.00	1.75	28.00	40.00	.....
179G	Alfalfa Stock Food.....		Guarantee	13.00	4.00	10.00	53.00	Wheat bran and alfalfa.	
179H	Alfalfa Meal.....		Guarantee	14.00	1.50	30.00	40.00	.....
179I	Wheat Mixed Feed and Screenings.		Guarantee	16.00	4.00	7.00	54.00	Wheat bran, shorts and screenings.	

178J	Wheat Bran and Screenings	Guarantee	15.50	3.50	8.50	53.00	.....
423A	O. W. A. Stock Feed.....	Guarantee	11.00	3.50	14.00	57.00	Corn chops, alfalfa, wheat bran, linseed oil meal and salt.
423B	O. W. A. Oats Food.....	Guarantee	11.00	3.50	15.00	57.00	Corn, oats, alfalfa, wheat bran, linseed oil meal and salt.
423C	O. W. A. Dairy Food.....	Guarantee	13.50	3.00	15.00	52.00	Alfalfa, wheat bran, linseed oil meal and salt.
423D	Alfalfa Poultry Mash with Grit and Charcoal.	Guarantee	14.00	3.00	8.00	60.00	Alfalfa, corn meal, wheat bran, shorts, grit, blood meal, meat meal, and charcoal.
423E	O. W. Hen Feed with Grit..	Guarantee	10.00	3.00	3.00	65.00	Corn, kafir, wheat, screenings, cane seed and grit.
423F	O. W. Chick Feed with Grit	Guarantee	10.00	2.00	3.00	60.00	Kafir, corn, wheat cracked, cane seed, millet, beef scrap, bone meal and grit.
423G	Dustless Alfalfa Meal.....	Guarantee	14.00	1.50	30.00	35.00	.....
423H	O. W. Sweet Feed No. 1....	Guarantee	10.00	2.00	20.00	50.00	Alfalfa and molasses.....
423I	O. W. Sweet Feed No. 2....	Guarantee	10.00	2.00	14.00	55.00	Alfalfa, corn and molasses.....
423J	O. W. Sweet Feed No. 3....	Guarantee	10.00	2.00	15.00	50.00	Alfalfa, corn, molasses and wheat bran.
423K	O. W. Sweet Feed No. 4....	Guarantee	10.00	2.00	15.00	50.00	Alfalfa, corn, molasses and oats....
351A	Wheat Bran and Screenings	Guarantee	14.50	3.50	10.00	52.00	.....
351B	Wheat Mixed Feed and Screenings.	Guarantee	16.00	3.70	8.50	55.00	Wheat bran, shorts and screenings..
351C	Wheat Shorts and Screenings	Guarantee	16.00	4.30	5.50	57.00	.....
351D	Corn Chops.....	Guarantee	9.00	4.00	3.50	70.00	.....
195A	Corn Chops	Guarantee	9.54	3.99	2.58	70.98	.....
197A	Wheat White Shorts.....	Guarantee	15.00	3.00	2.50	60.50	.....
197B	Wheat Mixed Feed and Screenings.	Guarantee	16.00	3.50	8.50	50.00	Wheat bran, shorts and screenings..
95B	Wheat Mixed Feed and Screenings.	Found.....	18.00	3.87	8.50	52.81	.....
56T	Wheat Mixed Feed and Screenings.	Found.....	18.11	4.40	8.38	51.58	.....

Otto Weiss Alfalfa Stock Food Co.

Red Star Mill and Elevator Co.

Stevens-Scott Grain Co.....

Wichita Flour Mills Co....

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	IFat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.
197C	Standard Wheat Shorts. . . .	Wichita Flour Mills Co.— Continued.	Guarantee	16.50	4.50	5.00	55.30	.....
197D	Corn Chops and Corn Bran		Guarantee	9.00	3.50	3.50	69.00	.....
197E	Wheat Bran and Screenings		Guarantee	14.50	3.50	10.00	48.00	.....
WICHITA FALLS, TEXAS.									
1743A	Cold Pressed Cottonseed. . .	Farmers Cotton Oil Co.	Guarantee	28.00	6.00	24.00	27.00	.....
3P	Cold Pressed Cottonseed. . .		Found. . . .	25.97	7.40	22.43	29.72	.....
1743B	Cold Pressed Cottonseed (made from bolly seed).		Guarantee	25.00	5.00	29.00	25.00	.....
1743B	Cold Pressed Cottonseed (made from bolly seed).		Found. . . .	22.05	6.17	22.72	37.37	.....
1366A	Corn Chops.	J. C. Hunt Grain Co.	Guarantee	9.00	3.00	3.50	70.00	.....
1366B	Corn and Speltz Chops. . . .		Guarantee	10.00	3.50	7.00	65.00	.....
1366C	Kafir and Milo Chops.		Guarantee	9.50	2.50	3.00	71.00	.....
1366D	Milo and Corn Chops.		Guarantee	9.25	3.00	3.00	70.00	.....
1366E	Kafir Chops.		Guarantee	9.50	2.75	3.00	71.00	.....
1366F	Milo Chops.		Guarantee	9.50	2.50	3.00	71.00	.....
1366G	Mixed Feed.		Guarantee	10.25	2.50	8.00	66.00	Milo and speltz chops.	
1366H	Mixed Feed.		Guarantee	10.00	2.25	5.50	67.00	Milo and barley chops.	
644A	Cottonseed Meal.		Guarantee	44.00	7.00	11.00	24.00	.....
644B	Cottonseed Cake.		Guarantee	44.00	7.00	11.00	24.00	.....
20P	Cottonseed Cake.		Found. . . .	46.29	6.82	9.12	23.48	.....
644C	Cottonseed Meal and Hulls	Wichita Cotton Oil Co.	Guarantee	43.00	5.00	12.00	22.00	.....
644C	Cottonseed Meal and Hulls		Found. . . .	43.17	11.36	11.65	22.06	.....
4P	Cottonseed Meal and Hulls		Found. . . .	48.67	7.70	7.04	23.39	.....
644D	Cottonseed Cake and Hulls		Guarantee	43.00	5.00	12.00	22.00	.....
644D	Cottonseed Cake and Hulls		Found. . . .	43.88	5.53	11.36	26.55	.....
644E	Cottonseed Meal and Hulls		Guarantee	40.00	5.00	14.00	24.00	.....
644E	Cottonseed Meal and Hulls		Found. . . .	41.44	5.97	13.57	26.83	.....

229B	Wheat Bran.....	Guarantee	15.33	4.20	8.00	54.00
229C	Wheat Shorts.....	Guarantee	15.00	3.25	4.00	60.00
229D	Corn Bran.....	Guarantee	8.50	5.00	12.00	60.00
229E	Kafir and Milo Chops and Wheat Bran.....	Guarantee	11.80	3.15	4.15	67.88
229F	Wheat Bran and Screenings	Guarantee	16.58	3.80	9.15	54.00
229G	Corn Chops.....	Guarantee	9.62	3.90	2.25	70.40
229H	Corn Chops, Wheat Bran and Screenings.....	Guarantee	10.90	3.77	4.30	66.30
229I	Corn Chops and Corn Bran	Guarantee	9.62	3.90	2.25	70.40
229K	Wheat Bran, Screenings and Corn Bran.....	Guarantee	12.54	4.40	10.57	57.00
229L	Mixed Chops.....	Guarantee	10.15	2.60	2.80	69.80
229M	Milo Chops.....	Guarantee	10.00	2.50	3.00	70.50

Wichita Mill and Elevator
Co.

WILLIS, TEXAS.

1040A	Corn Chops.....	Guarantee	9.00	3.50	3.00	70.00
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A. M. Carson.....

WILLS POINT, TEXAS.

958A	Ear Corn Chops with Shuck.....	Guarantee	7.50	2.50	12.00	60.00
87A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00
594A	Cottonseed Meal.....	Guarantee	44.00	7.00	11.00	24.00
120Y	Cottonseed Meal.....	Found....	42.00	6.40	10.94	28.19
594B	Cottonseed Cake.....	Guarantee	44.00	7.00	11.00	24.00
594B	Cottonseed Cake.....	Found....	47.35	6.38	8.50	25.67

Broadmoor Ranch.....

Johnson Gin Co.....

Willis Point Cotton Oil Co.

WINDOM, TEXAS.

281A	Corn Chops.....	Guarantee	9.00	4.00	3.00	70.00
281B	Corn Bran.....	Guarantee	9.00	5.00	12.00	55.00
281C	Corn Chops and Corn Bran	Guarantee	9.00	3.50	4.00	69.00
281D	Ground Wheat.....	Guarantee	12.00	2.00	2.00	71.00
281E	Milo Chops.....	Guarantee	9.50	2.50	3.00	71.00
281F	Kafir Chops.....	Guarantee	10.25	2.75	2.40	70.00
281G	Milo Chops and Corn Bran.	Guarantee	10.00	2.50	3.00	71.00
281G	Milo Chops and Corn Bran.	Found....	10.25	2.79	2.45	71.54

W. H. Dowlen & Son.....

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen in Protein Extract.	Ingredients.	Remarks.
105A	Wheat Bran.....	Baden-Vilm Milling Co.	Guarantee	14.50	3.50	10.00	50.00	.....
105B	Wheat Shorts.....		Guarantee	16.43	4.15	3.92	59.18	.....
105C	Corn Chops.....		Guarantee	9.00	3.00	1.62	70.00	.....
105D	Wheat Mixed Feed and Screenings.		Guarantee	15.00	3.75	9.00	55.00	Wheat bran, shorts and screenings.	
857A	Corn Chops.....	Clarkson Milling Co.	Guarantee	9.00	3.98	2.47	71.18	.....
857B	Wheat Bran.....		Guarantee	15.00	3.17	10.00	52.36	.....
857C	Wheat Shorts.....		Guarantee	15.25	3.09	4.15	63.13	.....
953A	Farmer Boy Mixed Feed.	Winfield Alfalfa Milling Co.	Guarantee	12.20	2.25	17.50	52.50	Corn, wheat bran and alfalfa meal.	
953B	Shamrock Mixed Feed.		Guarantee	12.30	2.25	17.00	50.00	Corn, wheat bran, shorts, alfalfa meal and salt.	
953C	Shamrock Alfalfa Meal.....		Guarantee	14.00	1.50	25.00	42.00	.....
WINONA, MINNESOTA.									
11199A	Sugarata Horse Feed.....	North-West Mills Co.	Guarantee	10.00	3.00	14.00	56.00	Corn, oats, barley, oat clippings, flax bran, malt sprouts, molasses and salt.	
11199B	Sugarata Dairy Feed.....		Guarantee	16.50	3.50	14.00	50.00	Cottonseed meal, flax bran, malt sprout, wheat screenings, molasses and salt.	
11199C	Sugarata Scratch Feed.....		Guarantee	12.00	3.50	12.00	50.00	Corn, wheat, barley, oats, buckwheat, kafir and sunflower seed.	
WINNSBORO, TEXAS.									
1993A	Mixed Feed.....	Will C. Anderson.....	Guarantee	10.00	3.50	3.00	70.00	Corn chops, peas and sorghum seed.	
932A	Milo Head Chops.....	M. D. Carlock.....	Guarantee	8.50	2.00	7.00	65.00	.....

1494A	Corn Chops.....	Carlock & Russell.....	Guarantee	9.00	3.00	3.00	70.00	
1676A	Corn Chops.....	Hardee Russell.....	Guarantee	9.00	3.50	3.00	70.00	
1795A	Cottonseed Meal.....	Farmers Cotton Oil Co.....	Guarantee	44.00	7.00	11.00	23.00	
48Y	Cottonseed Meal.....		Found....	42.19	6.87	9.92	28.30	
534A	Cottonseed Meal.....	Winnsboro Cotton Oil Co.....	Guarantee	44.00	7.50	11.00	23.00	Adulterated hulls.
49Y	Cottonseed Meal.....		Found....	38.82	7.96	12.28	28.28	
534B	Winner Mixed Feed.....		Guarantee	11.00	3.00	34.00	28.00	Cottonseed hulls and meal.
534C	Corn Chops.....		Guarantee	9.00	4.00	3.00	70.00	

WINTERS, TEXAS.

1304A	Cottonseed Meal.....		Guarantee	44.00	7.00	11.00	23.00	Adulterated hulls.
47W	Cottonseed Meal.....		Found....	41.63	6.87	11.98	26.43	
1304B	Cottonseed Cake.....	Winters Cotton Oil Co.....	Guarantee	44.00	7.00	11.00	23.00	Adulterated hulls.
48W	Cottonseed Cake.....		Found....	40.25	5.97	12.48	27.40	
1304C	Cottonseed Cake and Hulls.....		Guarantee	40.00	6.00	13.00	24.00	
1304C	Cottonseed Cake and Hulls.....		Found....	43.23	6.44	12.00	29.59	
1167A	Milo Chops.....	Winters Light and Milling Co.....	Guarantee	9.00	3.00	3.50	68.20	

WOLFE CITY, TEXAS.

225A	Cottonseed Meal.....		Guarantee	44.00	7.00	11.00	24.00	
61Y	Cottonseed Meal.....		Found....	46.69	8.05	8.38	23.85	
225B	Cremo Mixed Feed.....	Hunt County Oil Co.....	Guarantee	9.50	2.00	43.00	33.00	Cottonseed hulls and meal.
225C	Cottonseed Cake.....		Guarantee	44.00	7.00	11.00	25.00	
62Y	Cottonseed Cake.....		Found....	44.84	7.20	9.54	24.54	
2038A	Wheat Bran.....	W. R. Setzler Milling Co.....	Guarantee	14.50	3.50	10.00	55.00	
2038A	Wheat Bran.....		Found....	15.50	3.93	6.97	57.89	
2038B	Wheat Shorts.....		Guarantee	17.00	3.50	4.50	60.00	
2038B	Wheat Shorts.....		Found....	17.51	1.75	1.41	67.10	
243A	Wheat Bran.....	Wolfe City Milling Co.....	Guarantee	16.00	4.00	9.00	53.00	
243B	Wheat Shorts.....		Guarantee	16.00	2.25	3.00	62.00	
243C	Corn Chops.....		Guarantee	9.00	4.00	3.00	70.00	

WOLFE CITY, TEXAS—Continued.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Protein.	Fat.	Crude Fiber.	Nitrogen-Extract.	Ingredients.	Remarks.
243D	White Wolfe Mixed Bran...	Wolfe City Milling Co.— Continued.	Guarantee	14.00	3.50	10.00	50.00	Wheat and corn bran.	
243E	White Wolfe Mixed Feed...		Guarantee	11.87	3.10	3.98	67.86	Wheat bran and kafir chops.	
243F	White Wolfe Mixed Feed...		Guarantee	12.18	3.14	4.27	67.07	Kafir chops, wheat bran and screenings.	
243G	White Wolfe Mixed Feed...		Guarantee	12.18	3.14	4.27	67.00	Ground milo, wheat bran and screenings.	
243H	Milo Chops.		Guarantee	10.32	2.72	2.93	72.08		
243I	Kafir Chops.		Guarantee	10.30	2.91	2.50	71.85		
243J	White Wolfe Wheat Bran, Screenings and Corn Bran.		Guarantee	14.00	3.50	10.00	50.00		
145Y	White Wolfe Wheat Bran, Screenings and Corn Bran.		Found.	15.75	4.40	8.06	55.58		
243K	Wheat Bran and Screenings		Guarantee	16.00	4.00	9.00	53.00		

WOODWARD, OKLAHOMA.

758A	Corn Chops.	C. B. Cozart.	Guarantee	9.00	4.00	3.00	70.00		
743A	Corn Chops.	W. J. Driskell.	Guarantee	9.00	4.00	3.00	70.00		
743B	Kafir Chops.		Guarantee	9.19	3.50	3.00	70.00		
431A	Corn Chops.	Hoops & Maddox.	Guarantee	10.06	4.36	2.54	72.12		
431B	Kafir Chops.		Guarantee	9.19	2.87	2.15	74.35		

WORTHAM, TEXAS.

1204A	Corn Chops.	Northern Milk Maker Mixed Feed.	Guarantee	9.00	4.00	3.00	70.00		
1204B	Northern Milk Maker Mixed Feed.		Guarantee	12.00	4.50	25.00	35.00	Cottonseed meal and hulls, wheat bran and rice bran.	
1204C	Wheat Bran and Milo Chops		Guarantee	12.50	3.40	7.00	62.00		

1204D	Cooper Mixed Horse and Cow Feed.	J. W. Cooper	Guarantee	12.00	4.50	25.00	35.00	Cottonseed meal and hulls, wheat bran and corn.
1204E	Corn and Milo Chops.		Guarantee	9.00	3.00	3.00	70.00	
517A	Cottonseed Meal.		Guarantee	44.00	7.00	11.00	22.00	
24B	Cottonseed Meal.		Found.	44.88	8.78	10.10	24.13	
517B	Cottonseed Cake.	Wortham Cotton Oil Co.	Guarantee	44.00	7.00	11.00	22.00	

WINNEWOOD, OKLAHOMA.

1458A	Corn Chops.	John A. Rollow	Guarantee	9.00	4.00	3.00	70.00	
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YOAKUM, TEXAS.

1895A	Corn Chops.		Guarantee	9.00	3.50	3.00	70.00	
1895B	Corn and Cob Chops.		Guarantee	8.00	3.00	7.50	63.50	
1895C	Milo Chops.	Orth Milling Co.	Guarantee	10.00	2.50	3.00	70.50	
1895D	Corn Bran.		Guarantee	8.00	3.00	12.00	63.00	
585A	Cottonseed Meal.		Guarantee	44.00	7.00	8.00	23.00	
38T	Cottonseed Meal.	Yoakum Cotton Oil Co.	Found.	47.57	9.78	6.89	23.04	

YORKTOWN, TEXAS.

639A	Corn Chops.		Guarantee	9.00	3.00	3.50	65.00	Adulterated corn bran
103T	Corn Chops.		Found.	10.50	4.25	3.29	70.05	
639B	Corn Chops and Corn Bran		Guarantee	9.00	3.00	4.00	65.00	
639C	Ear Corn Chops.		Guarantee	8.50	3.00	10.00	65.00	
55T	Ear Corn Chops.		Found.	9.21	3.42	8.95	66.08	
639D	Corn Chops with Cob.		Guarantee	8.50	3.00	10.00	65.00	
639E	Corn Bran.		Guarantee	8.50	4.50	12.00	60.00	
639F	Chicken Feed.		Guarantee	9.00	3.00	3.50	65.00	Corn, corn chops, oats, milo and wheat screenings.
639G	Mixed Feed.		Guarantee	12.00	3.50	8.00	58.00	Wheat bran and corn feed meal.
639H	Mixed Chops.		Guarantee	9.00	3.00	3.50	65.00	Corn and milo chops.
639I	Milo Head Chops.		Guarantee	8.50	2.50	8.00	65.00	
639I	Milo Head Chops.		Found.	10.13	2.63	7.83	64.79	

Strieber Brothers.

No.	Name of Feed.	Name of Manufacturer.	Analysis.	Pro- tein.	Fat.	Crude Fiber.	Nitrogen- Free Extract.	Ingredients.	Remarks.	
363A 5T 363B 6T	Cottonseed Meal..... Cottonseed Meal..... Cottonseed Cake..... Cottonseed Cake.....	{ Yorktown Cotton Oil and Manufacturing Co.,.... }	Guarantee Found..... Guarantee Found.....	47.00 48.53 47.00 47.67	5.00 7.94 5.00 7.21	11.00 7.13 11.00 8.26	22.00 24.35 22.00 25.96	..... ..... ..... .....	..... ..... ..... .....
YUKON, OKLAHOMA.										
701A	Corn Chops.....		D. Bawden & Son.....	Guarantee	9.00	4.00	3.00	70.00
1026A 1026B 1026C 1026D 1026E 1026F	Corn Chops..... Wheat Bran..... Wheat Shorts..... Kafir Chops..... Wheat Chops..... Wheat Bran and Screenings		{ Yukon Mill and Grain Co.. }	Guarantee Guarantee Guarantee Guarantee Guarantee Guarantee	9.00 14.50 15.50 9.50 12.00 14.50	3.50 3.50 3.50 2.75 2.00 3.50	3.00 10.00 50.00 55.00 3.00 10.00	70.00 70.00 50.00 71.00 71.00 50.00

**COPY OF LAW REGULATING SALE OF FEED STUFFS IN THE
STATE OF TEXAS.**

CHAPTER IV, ARTICLES 730 TO 740 INCLUSIVE.

EFFECTIVE JULY 11, 1907.

An Act to amend Sections 1, 4, 5, 6 and 11, of Chapter 108, Acts of the Twenty-ninth Legislature, being an Act entitled 'An Act regulating the sale of concentrated commercial feeding stuffs and the materials from which they are manufactured, defining concentrated feeding stuffs, prohibiting their adulteration, providing for their correct weighing and marking, and providing for the collection of samples, the expenses of the enforcement of the law, and fixing penalties for its violation,' and to add thereto:

"Section 11A. Empowering the director of the Experiment Station to adopt standards and definitions for concentrated feeding stuffs and to refuse the registration of feeding stuff under certain circumstances, and to cancel registration under certain circumstances after notice, and to empower said director to adopt rules and regulations for the enforcement of all of the provisions of this act."

Be it enacted by the Legislature of the State of Texas:

SECTION 1. That Sections 1, 4, 5, 6 and 11, of Chapter 108, of the Twenty-ninth Legislature, entitled "An Act regulating the sale of concentrated commercial feeding stuffs and the materials from which they are manufactured, defining concentrated feeding stuffs, prohibiting their adulteration, providing for their correct weighing and marking and providing for the collection of samples, the expenses of the enforcement of the law and fixing penalties for its violation," be so amended as to hereafter read as follows, and that

Section 11A, empowering the director of the Experiment Station to adopt standards and definitions for concentrated feeding stuffs and to refuse the registration of feeding stuffs under certain circumstances and to cancel registration under certain circumstances after notice, and to empower said director to adopt rules and regulations for the enforcement of all the provisions of this act, be enacted so as to read as follows:

"SECTION 1. Every lot or parcel of concentrated feeding stuffs, as defined in Section 3 of this act, used for feeding farm live stock, sold, offered or exposed for sale in the State of Texas for use within this State, shall have printed on a tax tag, described in Section 5 of this act, a plainly printed statement clearly and truly certifying the number of net pounds of feeding stuff in the package, stating the name or names of materials of which such weight is composed where the contents are of a mixed nature, the name, brand or trade-mark under

which the article is sold, the name and the address of the manufacturer or importer, the place of manufacture, such information as is required by Section 11, if any, and a chemical analysis stating the minimum percentages it contains of crude protein, allowing 1 per cent. of nitrogen to equal $6\frac{1}{4}$ per cent. of protein, of crude fat, of nitrogen-free extract, and the minimum percentage it contains of crude fiber; these constituents to be determined by the methods adopted at the time by the Association of Official Agricultural Chemists of the United States. Mill products hereinafter mentioned shall have the following standard weights, viz.: Flour, one hundred and ninety-six (196) pounds per barrel, or forty-eight (48) pounds per sack; corn meal, bolted or unbolted, thirty-five (35) pounds per sack; rice bran, one hundred and forty-three (143) pounds per sack; rice polish, two hundred (200) pounds per sack; and other feeds made from cereals of any kind, whether pure, mixed, or adulterated, one hundred (100) pounds per sack. Fractional barrels and sacks shall weigh in the same proportion, and these weights shall be net and exclusive of the barrel or sack in which said product is packed. Any person, firm or association of persons engaged in the manufacture of mill products of any character whatsoever, who shall use any bag, box, barrel or any other receptacle into which to put such product other than one bearing the name of such mill manufacturing the same, shall be guilty of a misdemeanor, and upon conviction therefor shall be fined in any sum from one hundred dollars to one thousand dollars, or in addition thereto be confined in the county jail for a term of thirty days, or both such fine and imprisonment."

SEC. 2. The term concentrated commercial feeding stuffs, as herein used, shall not include hay and straw, the whole seed or grains of wheat, barley, rye, oats, Indian corn, rice, buckwheat or broom corn, or any other whole or unground grains or seeds.

SEC. 3. The term concentrated feedstuffs, as herein used, shall include wheat bran, wheat shorts, linseed meals, cottonseed meals, pea meals, cocoanut meals, gluten meals, gluten feeds, maize feeds, starch feeds, sugar feeds, dried brewer's grains, malt sprouts, hominy feeds, ceraline feeds, rice meals, rice bran, rice polish, rice hulls, oat feeds, corn and oat chops, corn chops, ground beef, or mixed fish feeds, and all other materials of similar nature not included in Section 3 of this act.

SEC. 4. Before any concentrated feeding stuff, as defined in Section 3 of this act, is offered or exposed for sale, the importer, manufacturer, and party who causes it to be sold or offered for sale within the State of Texas for use within this State shall, for each and every feedstuff bearing a distinguishing name and trade-mark, file with the director of the Texas Agricultural Experiment Station a certified copy of the statement named in Section 1 of this act, and shall also deposit with said director a sealed glass jar or bottle containing not less than one pound of the feeding stuff to be sold or offered for sale, accompanied by an affidavit that it is a fair average sample thereof and corresponds within reasonable limits to the feeding stuff which it represents in the percentage of protein, fat and crude fiber and nitrogen-

free extract which it contains. This shall not be construed to apply to farmers who grind their own feedstuffs and who do not adulterate same.

SEC. 5. The manufacturer, importer, agent or seller of each concentrated commercial feeding stuff, as defined in Section 3 of this act, shall, before the article is offered for sale, pay to the director of the Texas Agricultural Experiment Station an inspection tax of 10 cents per ton for each ton of such concentrated feeding stuff sold or offered for sale in the State of Texas for use within this State, and shall affix to each lot shipped in bulk, and to each bag, barrel or other package of such concentrated feeding stuffs a tag to be furnished by said director stating that all charges specified in said section have been paid. The director of said Texas Agricultural Experiment Station is hereby empowered to prescribe the form of such tags and adopt such regulations as may be necessary for the enforcement of this law. Whenever the manufacturer, or importer or shipper of a concentrated feeding stuff shall have filed a statement made in Section 1 of this act, and have paid the inspection tax, no agent or seller of said manufacturer, importer or shipper, shall be required to file such statement or pay such tax. The amount of the inspection tax and penalties received by said director shall be paid into the State Treasury. So much of the inspection tax and penalties collected under this act shall be paid by the State Treasurer to the Treasurer of the Texas Agricultural and Mechanical College as the director of the Texas Agricultural Experiment Station may show by his bills has been expended in performing the duties required by this act, but in no case to exceed the amount of the inspection tax and penalties received by the State Treasurer under this act. Provided the excess, if any, for the next two years may be used as it accrues by the Board of Directors of the Agricultural and Mechanical College for the purpose of putting up a station administration building to provide the necessary offices and laboratory space, in order that the purpose of this act may be carried out.

SEC. 6. Any manufacturer, importer or agent selling, offering or exposing for sale any concentrated commercial feeding stuff as defined in Section 3 of this act, without the statement required by Section 1 and the tax required by Section 5 of this act, or with a label stating that said feeding stuff contains substantially a larger percentage of protein, fat or nitrogen-free extract, or a smaller quantity of crude fiber than is contained therein, and any person violating any other provisions of this act shall, on conviction in a court of competent jurisdiction, be fined not less than one hundred dollars nor more than five hundred dollars for the first conviction, and not less than five hundred dollars nor more than one thousand dollars for each subsequent conviction.

SEC. 7. Any person who shall counterfeit or use a counterfeit of the tag or tags prescribed by this act, knowing the same to be counterfeited, or who shall use them a second time after the said tags shall have once been attached, shall be guilty of a misdemeanor, and on conviction thereof shall be fined in a sum not exceeding five hundred dollars, one-

half of which shall be paid to the informer; which fine may be doubled or tripled at each second or third conviction, and so on progressively for subsequent convictions.

SEC. 8. All manufacturers and importers of concentrated commercial feeding stuffs, or dealers in same, shall, when requested, furnish the director of the Texas Experiment Station with a complete list of names or trade-marks of such feeding stuffs.

SEC. 9. The director of the Texas Agricultural Experiment Station shall cause one analysis or more to be made annually of each concentrated commercial feeding stuff sold or offered for sale under the provisions of this act. Said director is hereby authorized in person, or by deputy, to take a sample not exceeding two pounds in weight for analysis from any lot or packages of concentrated commercial feeding stuffs which may be in the possession of any manufacturer, importer, agent, dealer or buyer in this State, but said sample shall be drawn or taken in the presence of said party or parties at interest or their representative, and shall be taken from a parcel, lot or number of parcels which shall not be less than 5 per cent of the whole lot inspected, and shall be thoroughly mixed and divided into two samples and placed in glass or metal vessels carefully sealed and label placed on each stating the name or brand of the feeding stuff or material sampled, and the name of the party from whose stock the sample is drawn and the date any place of taking such sample, and said label shall be signed by the director or his deputy and the party or parties at interest, or their representatives present at the taking and sealing of said sample; provided, that where the party or parties at interest refuse to be present and take part in the sampling of the said feedstuffs, the director or his deputies may take said samples in the presence of two disinterested witnesses, one of said duplicate samples shall be retained by the director and the other shall be left with the party whose stock was sampled, and the sample or samples retained by the director shall be for comparison with the certified statements made in Sections 1 and 4 of this act. The result of the analysis of the sample or samples so prescribed, together with such additional information as circumstances advise, shall be published in reports or bulletins by the Texas Agricultural and Mechanical College from time to time.

SEC. 10. The term importer for all purposes of this act shall be taken to mean all such persons as shall bring into or offer for sale within the State concentrated commercial feeding stuffs manufactured without this State.

SEC. 11. Any person manufacturing, selling or offering for sale any adulterated feeding stuff within this State, shall, upon conviction therefor, be punished by fine of not less than twenty-five dollars and not more than two hundred dollars, or be imprisoned in the county jail for a term of not less than thirty days and not more than sixty days, or by both such fine and imprisonment. For the purpose of this act a feeding stuff shall be deemed to be adulterated if it contains any sawdust, dirt, damaged feed, or any foreign matter whatever, or if it is in any respect not what it is represented to be, or if any rice hulls or

chaff, peanut shells, corn cobs, oat hulls, or other similar substances of little or no feeding value are admixed therewith; provided, that no wholesome mixture of feeding stuff shall be deemed to be adulterated if the true percentage of constituents thereof is plainly and clearly stated on the package and made known to the purchaser at the time of the sale. It shall be the duty of the director of the Experiment Station to examine, or have examined for adulteration, all suspicious samples of feeding stuffs and such other samples as may be desirable.

SEC. 11a. The director of the Experiment Station is hereby empowered to adopt standards or definitions for concentrated feeding stuffs and such regulations as may be necessary for the enforcement of the law. The said director shall have the power to refuse the registration of any feeding stuff under a name which would be misleading as to the materials of which it is made up, or which does not conform to the standards and definitions aforesaid. Should any of said materials be registered and it is afterwards discovered that they are in violation of the above provisions, the said director shall have the power to cancel the registration ten days after notice. The director of the Texas Experiment Station is hereby empowered to adopt such regulations as may be necessary for the enforcement of all the provisions of this act.

SEC. 12. The fact that the present feedstuff law imposes a greater tax than is necessary for the enforcement of the provisions thereof and is indefinite and uncertain in some of its provisions, creates an emergency and an imperative public necessity that the constitutional rule requiring bills to be read on three several days be suspended, and that this act take effect from and after its passage, and it is so enacted.

(Note.—This law becomes effective July 11, 1907.)

TEXAS AGRICULTURAL EXPERIMENT STATION

BULLETIN NO. 195

AUGUST, 1916

DIVISION OF AGRONOMY

JAPANESE SUGAR CANE AS A FORAGE CROP



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1916

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BULLETIN NO. 195

AUGUST, 1916

DIVISION OF AGRONOMY

JAPANESE SUGAR CANE AS A FORAGE CROP

BY

A. H. LEIDIGH, B. S.,
Agronomist,

IN CONSULTATION WITH

G. T. McNESS,
Superintendent, Substation No. 11, Nacogdoches, and

H. H. LAUDE, B. S.,
Superintendent, Substation No. 4, Beaumont



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Digestibility of Sugars, Starches and Pentosans of Roughages

BY

G. S. FRAPS, PH. D., CHEMIST IN CHARGE; STATE CHEMIST.

Comparatively little work has been done upon the composition and digestibility of the nitrogen-free extract of feeding-stuffs. The writer (Bulletin No. 172, N. C. Experiment Station, 1900) has studied the digestibility of sugars and pentosans, and given a review of the literature up to 1900. Further data is given by the writer in Bulletin No. 104 of the Texas Experiment Station. Dr. Frear (Pennsylvania Report, 1903-4) has studied the composition of timothy hay in detail, and Dr. Headden (Bulletin No. 124, Colorado Experiment Station, 1907) has made quite extensive studies into the composition, constituents, and digestibility of a number of feeding-stuffs. As this bulletin is largely a report of progress, we will not go further into the literature of the subject, but will postpone such discussion to a later bulletin.

METHODS OF WORK.

The material used in this work was secured in the digestion experiments described in Bulletin No. 147 (1912) of this Station. For details of the digestion work, reference should be made to that bulletin.

Reducing Sugars.—Five grams substance is added to 75 c.c. water and let stand for thirty minutes, stirring about every five minutes, filtered, and washed to a volume of about 175 c.c. in a 200 c.c. flask. Five c.c. lead subacetate is added and shaken well. Ten c.c. of 10 per cent. sodium sulphate is added and the mixture shaken. Ten c.c. of 10 per cent. copper sulphate is added and shaken and the liquid made up to 200 c.c. It is then filtered immediately through a fluted filter into a dry flask. Thirty c.c. of Allihn's copper solution, 30 c.c. of alkaline tartrate solution, and 35 c.c. water are placed in a beaker and heated to boiling. Then add 50 c.c. of the above solution, heat to boiling, and as soon as it boils, turn over the two minute sand glass, heat two minutes, then filter immediately through a thick asbestos filter without diluting, and wash thoroughly with hot water. Determine copper by Low's method (A. O. A. C. Methods). Calculate to reducing sugars.

Total Sugars.—(b) Fifty c.c. is placed in a beaker, 5 c.c. of concentrated hydrochloric acid added, the beaker placed in a water bath which is at 70°, with a thermometer arranged so that it hangs in the center of the beaker. It should take about two and one-half minutes to reach 69°, and should be maintained at this temperature for seven and one-half minutes. Then cool and neutralize with sodium car-

bonate. Heat up the mixed reagent as in (a), pour into the beaker, heat to boiling and boil two minutes, and complete as in (a). Calculate to dextrose, subtract the reducing sugars, and the result multiplied by 0.95 is the di-sugars or polysaccharoses.

Starch.—Weigh out 4 grams of the material if it is a hay or excrement; if it is corn chops, kafir, rice polish, or a similar concentrate, use 2 grams—and extract with five successive portions of 10 c.c. each of ether on a hardened filter No. 589. Wash the residue from the paper into a beaker with 100 c.c. of water. Run a blank on the malt with each set. Heat on a sand bath to boiling with constant stirring and continue the boiling and stirring thirty minutes. Replace the water lost by evaporation. Immerse the beaker in a water bath and keep it between 55° and 60°. When cooled to 55° C., add 10 c.c. of fresh extract of malt. (See below.) Do not add the malt extract until the liquid is cooled. Digest the mixture with occasional stirring for one hour at 55° to 60° C. Boil a second time for fifteen minutes, replace the water lost by evaporation, cool to 55° and digest as before with 10 c.c. of malt extract for one hour. Heat to boiling, cool, and make up to 250 c.c. in a graduated flask. Filter through a dry paper and remove 200 c.c. of the filtrate to 500 c.c. flask. Plug the flask with cotton wool. Twenty c.c. of the 25 per cent. hydrochloric acid, specific gravity, 1.125, is added and heated for three hours in a boiling water bath, then cooled. Neutralize with carbonate of soda, make up to 500 c.c. and filter through a dry paper. Determine the reducing sugars in the filtrate by the Allihn method. Calculate the total cuprous oxide reduced to dextrose, then subtract the blank in the malt, previously calculated to dextrose. Next divide by the quantity of substance used. The total sugars must be subtracted before calculating to starch.

Malt Extract.—Digest cold two to three hours 20 grams of fresh malt over night with 200 c.c. of water and filter. This solution will not keep over thirty hours. Each time a fresh solution is made up, determine the reducing sugars produced from it, using 20 c.c. and going through the above process with pure water the same as if it contained starch.

Pentosans in Nitrogen-Free Extract.—The digestibility of the pentosans is discussed in another Bulletin (see Bulletin No. 175). The pentosans in the nitrogen-free extract are inserted in the table for the purpose of comparison and discussion.

Reducing Sugars from Hemi-Cellulose.—This term is applied to the sugars produced from material dissolved by approximately N/50 acid and approximately N/50 alkali. Two grams substance was boiled thirty minutes with 200 c.c. water and 20 c.c. N/5 hydrochloric acid, then 40 c.c. N/5 sodium hydroxide added, and the boiling continued for fifteen minutes. It was then filtered through asbestos, the volume of the filtrate made 400 c.c., placed in a 500 c.c. flask, and 40 c.c. of 25 per cent. hydrochloric acid added. The liquid was heated three hours in a boiling water bath, cooled, nearly neutralized with caustic

soda, and made up to 500 c.c. Dextrose was then determined by the Allihn method. As the filtrate contains both the starch and reducing sugars, these were subtracted (as dextrose) from the result, and the remainder taken to be dextrose as reducing sugars from hemi-celluloses. Pentosans were dissolved by the acid and alkali, and partly destroyed (see Bulletin No. 175). Pentosans have nearly the same reducing power as dextrose.

Material Rendered Insoluble by Acid.—The treatment with hydrochloric acid (25 per cent.) in the above method rendered some of the material insoluble, as a brown or black powder. This was filtered off on asbestos, washed with water, and the quantity estimated. This substance is, of course, indefinite.

Soluble Residue.—The “residue” is left after subtracting the sugars, starch, pentosans and material rendered insoluble by acid, from the soluble nitrogen-free extract. It represents the nitrogen-free extract soluble in approximately N/50 acid and alkali, not included in the groups named.

Soluble Nitrogen-Free Extract.—We use this term to designate the nitrogen-free extract dissolved by approximately N/50 acid and alkali as described in the following method:

Reagents, Fifth Normal Sulphuric Acid.—Dilute 25 c.c. sulphuric acid with 4000 c.c. water and titrate 10 c.c. with N/10 ammonia and cochineal. Adjust so that 10 c.c. requires from 19.9 to 20.2 c.c. ammonia to neutralize.

Caustic Soda.—Dissolve 35 grams caustic soda pure by alcohol in 4000 c.c. water. Titrate 10 c.c. with N/5 hydrochloric acid and cochineal and adjust so that 10 c.c. requires between 9.95 to 10.05 c.c. of the acid.

Estimation.—Extract 2 grams material with ether. Transfer to tall beaker and add 200 c.c. boiling water (measured with a cylinder) and 20 c.c. fifth normal sulphuric acid, measured with a pipette. Boil thirty minutes, using a round-bottom flask as a condenser. While boiling, add 40 c.c. fifth normal caustic soda measured with a pipette and continue to boil for fifteen minutes. Filter on asbestos, wash with hot water, then once with alcohol and dry ten hours. Weigh, ignite, and weigh again. The loss in weight is the total material insoluble in approximately N/50 acid and alkali. This includes crude fiber and proteins. The proteins were determined, and proteins plus crude fiber subtracted from the insoluble residue. The difference is the insoluble nitrogen-free extract. This is not strictly correct, as the crude fiber contains some protein. The total nitrogen-free extract less the insoluble gives the soluble nitrogen-free extract.

COMPOSITION OF THE FEEDS.

Table 1 shows the percentage composition of the roughages used in the experiments. Table 2 shows the percentage composition of the nitrogen-free extract.

TABLE 1.—COMPOSITION OF ROUGHAGES—PER CENT.

Lab. No.	Name of Feed.	Sugars		Starch.	Soluble Pen-tosans.	Reduc-ing sugar from hemi-cellulose.	Rend-ered in-soluble by acid.	Total except sugars from hemi-cellulose.	Soluble residue.	Total N. F. Extract soluble.	Insoluble N. F. Extract	Total N. F. Extract.
		Mono.	Di.									
3277	Alfalfa hay used in Experiment No. 3.	1.84	0.95	1.46	5.90	3.55	4.75	14.80	12.07	26.97	7.41	34.78
4252	Bermuda hay used in Experiment No. 12.	2.20	1.41	1.08	4.34	0.71	2.63	11.66	5.89	17.55	28.71	46.26
3609	Burr clover used in Experiment No. 6.	1.17	.11	1.90	6.18	3.15	6.44	13.80	8.70	24.50	7.41	31.91
3833	Buffalo grass used in Experiment No. 9.	2.86	.84	4.07	4.93	0.39	2.27	14.77	4.39	19.16	25.71	44.87
4557	Corn shucks used in Experiment No. 17.	1.37	1.17	2.01	12.11	8.40	1.85	17.51	7.66	25.17	29.34	54.51
3220	Cowpea hay used in Experiment No. 1.	1.33	1.22									34.42
4552	Guam grass used in Experiment No. 16.	2.52	.57	1.14	4.74	0.43	5.81	14.78	7.96	22.74	26.89	49.63
3587	Johnson grass hay used in Experiment No. 4.	1.57	.07	1.06	5.71	4.06	3.79	12.20	6.84	19.04	22.83	41.87
4238	Johnson grass hay used in Experiment No. 10.	2.72	.59	1.89	4.82	0.86	3.54	13.56	7.67	21.23	23.50	44.73
4546	Kafir fodder used in Experiment No. 15.	4.70	.59	1.33	5.05	0.52	2.57	14.04	10.05	24.09	20.35	44.44
4247	Millet used in Experiment No. 11.	2.35	.98	1.49	9.03	8.61	3.28	27.13	2.47	29.62	18.37	47.89
3595	Oat hay used in Experiment No. 5.	2.34	.30	5.01	4.08	1.39	3.73	15.36	4.68	20.04	24.35	44.39
4259	Peanut hay used in Experiment No. 13.	2.27	2.18	3.45	5.04	0.36	3.97	16.91	16.33	33.24	6.65	39.89
4271	Para grass used in Experiment No. 14.	4.55	0.88	0	5.28	2.70				23.97	23.10	46.17
3625	Rice straw, Japan, used in Experiment No. 7.	1.85	0.15	5.90	2.49	3.09	2.21	12.26	3.09	15.35	22.17	37.52
4663	Rice straw, Honduras, used in Experiment No. 18.	0.88	0.12	1.72	3.78	3.73	2.58	8.88	7.90	16.78	23.72	40.50
3234	Sorghum hay used in Experiment No. 2.	4.86	0.95	1.28	3.16	0.40	3.63	14.39	8.15	22.74	24.05	46.49
3649	Vetch hay used in Experiment No. 8.	0.70	0.32	0.88	5.23	4.48	5.94	13.07	14.02	27.09	10.21	37.30

TABLE 2.—PERCENTAGE COMPOSITION OF NITROGEN-FREE EXTRACT.

Lab. No.	Name of Feed.	Sugars		Starch.	Soluble Pen- tosans.	Reduc- ing sugar from hemi- cellulose.	Ren- dered in- soluble by acids.	Total except in- sugars from hemi- cellulose.	Soluble residue.	Total N. F. Extract soluble.	Insoluble N. F. Extract.
		Mono.	Di.								
3277	Alfalfa hay used in Experiment No. 3.	5.3	2.7	4.2	17.0	10.2	13.7	42.8	34.7	77.5	21.3
3278	Hermuda hay used in Experiment No. 12.	4.8	3.0	2.3	9.4	1.5	5.7	25.2	12.7	37.9	62.1
3609	Burr clover used in Experiment No. 6.	3.7	0.3	6.0	19.4	9.9	20.2	43.4	37.3	76.8	23.2
3883	Buffalo grass used in Experiment No. 9.	5.9	1.9	9.1	11.0	0.9	5.1	32.9	9.8	42.7	57.3
4357	Corn sheels used in Experiment No. 17.	2.5	0.3	3.7	22.2	15.4	3.4	32.1	14.1	46.2	53.8
3220	Cowpea hay used in Experiment No. 1.	3.9	3.5	...	...	...	...	...	...	...	...
4552	Guam grass used in Experiment No. 16.	5.1	1.1	2.3	9.6	0.9	11.7	29.9	16.0	45.8	54.2
3587	Johnson grass used in Experiment No. 4.	3.7	0.2	2.5	13.6	9.7	9.1	29.1	16.3	45.3	54.5
4238	Johnson grass used in Experiment No. 10.	6.1	1.3	3.0	10.8	1.9	7.9	30.5	17.2	47.5	52.5
4546	Kafir fodder used in Experiment No. 10.	10.6	1.3	...	11.4	1.2	5.3	3.2	34.2	45.8	...
4247	Millet used in Experiment No. 11.	4.9	2.0	24.0	18.9	18.0	6.8	56.7	5.2	61.8	38.1
3595	Oat hay used in Experiment No. 5.	5.0	0.7	11.3	12.6	3.1	8.4	34.6	10.5	45.3	54.7
4259	Peanut hay used in Experiment No. 13.	5.7	5.5	8.6	11.4	9.8	10.0	42.4	40.9	83.3	16.7
3271	Para grass used in Experiment No. 14.	9.4	1.9	0	11.4	5.8	...	...	...	30.0	50.0
3625	Rice straw, Japan, used in Experiment No. 7.	4.7	0.4	15.7	6.3	8.2	5.9	32.7	8.2	40.9	59.1
3953	Rice straw, Honduras, used in Experiment No. 18.	1.7	0.3	4.2	8.3	9.4	6.4	31.9	19.5	41.4	58.6
3924	Sorghum hay used in Experiment No. 2.	10.5	1.4	2.8	8.9	9.9	7.8	31.4	19.5	41.4	58.6
3644	Vetch hay used in Experiment No. 8.	1.9	0.9	2.4	14.0	12.0	15.9	35.0	37.6	72.6	27.4

The feeds contain only small percentages of sugars and starch. An exception is millet, which contained some grain. Rice straw apparently contains over 5 per cent. starch, but this is probably due to substances other than starch.

The reducing sugars formed from the material dissolved by the approximately N/50 acid and alkali are not equal to the pentosans so dissolved. As shown in another Bulletin (No. 175), pentosans or pseudo-pentosans, are destroyed by the treatment with these reagents. The quantity destroyed, however, is less than the difference between the soluble pentosans and the reducing power of the solution, so that further destruction of pentosans must take place during the inversion with hydrochloric acid. We should further expect a production of hexose sugars, due to the solvent action of the N/50 acid or alkali upon hemi-celluloses, but these must have also been in part or largely destroyed by the inversion with hydrochloric acid.

During the inversion with hydrochloric acid, a black powder separated out, strongly resembling the so-called "humic acid" formed by the action of acids upon sugar. This substance was filtered off, and estimated. The determination of such an indefinite body can lay little claim to accuracy. We should judge that, in part at least, it is derived from sugars.

The estimation of the pentosans and hexoses dissolved from feeding-stuffs by dilute acids, thus requires study, as both pentosans and hexosans are no doubt destroyed in the process of the estimation, so that the results are too low.

The nitrogen-free extract dissolved by approximately N/50 acid and alkali from legumes and from non-legumes is quite different in proportion. While from one-third to one-half of the nitrogen-free extract of non-legumes is dissolved, from legumes three-fourths to four-fifths dissolves. The nitrogen-free extract of legumes is thus more readily soluble than that of non-legumes.

DIGESTIBILITY OF THE MATERIALS.

Table 3 shows the co-efficients of digestibility of the groups of materials estimated, which are worked out in Table 9.

TABLE 3.—COEFFICIENTS OF DIGESTIBILITY.

Lab. No.	Name of Feed.	Sugars		Starch.	Soluble Pen- tans.	Reduc- ing sugar from hemi- cellulose	Ren- dered in- soluble by acids.	Soluble residue.	Total N.F. Extract soluble.	Insoluble N.F. Extract.	Total N.F. Extract.
		Mono.	Di.								
3277	Alfalfa hay used in Experiment No. 3.	98.5	98.2	93.8	75.7	61.6	8.59	74.7	71.6	77.1	65.0
4252	Bermuda hay used in Experiment No. 12.	98.4	98.7	82.9	55.5	64.0	70.3	92.2	59.8	43.6	50.2
3609	Burr clover used in Experiment No. 6.	98.7	82.9	82.4	85.4	64.0	91.9	92.2	85.1	45.8	75.9
3883	Buffalo grass used in Experiment No. 9.	98.8	98.1	91.0	65.4	0	0	28.2	62.9	55.2	58.0
4557	Corn sheels used in Experiment No. 17.	97.8	98.7	92.7	80.9	70.8	0	52.1	63.1	56.5	60.6
3220	Cowpea hay used in Experiment No. 1.	90.1	99.1	92.7	80.9	70.8	0	52.1	63.1	56.5	60.6
4552	Gum grass used in Experiment No. 16.	98.8	98.5	68.4	60.2	0	4.5	69.2	6.34	51.7	65.3
3587	Johnson grass hay used in Experiment No. 4.	98.6	89.8	38.9	65.7	67.5	11.1	37.6	49.1	52.1	52.3
4238	Johnson grass hay used in Experiment No. 10.	94.5	98.3	95.2	76.0	0	18.8	61.5	64.6	57.7	61.0
4546	Kafir fodder used in Experiment No. 15.	99.4	99.1	93.7	80.1	0	3.3	77.3	78.4	55.0	69.4
4247	Millet used in Experiment No. 11.	95.9	93.6	71.5	84.3	91.9	7.1	04	67.3	45.1	59.3
3595	Oat hay used in Experiment No. 5.	99.4	69.9	99.1	73.2	14.7	6.2	87.9	56.1	69.3	66.8
4259	Peanut hay used in Experiment No. 13.	97.2	97.9	99.5	88.4	0	92.2	87.9	91.7	37.3	74.3
4277	Para grass used in Experiment No. 14.	93.7	99.6	95.9	49.7	17.9	0	53.4	46.9	37.5	46.9
3625	Rice straw, Japan, used in Experiment No. 7.	97.5	99.7	95.9	23.6	46.7	0	67.5	46.9	42.6	45.0
4663	Rice straw, Honduras, used in Experiment No. 18.	88.6	56.2	65.5	51.7	71.4	0	67.5	51.8	43.6	47.3
3224	Sorghum hay used in Experiment No. 2.	99.7	95.5	79.1	71.3	0	4.9	54.0	67.3	62.9	65.0
3649	Vetch hay used in Experiment No. 8.	95.7	99.2	91.2	71.0	64.2	79.8	54.0	65.8	62.7	74.5

The sugars are highly digested. This is in accord with previous work (N. C. Bulletin No. 172, Texas Bulletin No. 104). One or two cases of lower digestibility occur, but as the excrements contain other reducing substances in addition to sugars, it is quite possible that the lower results are due to these substances and not to the presence of sugars.

Starch also has a high digestibility. There are some cases in which the digestibility is low, notably with millet. It is probable that other substances in addition to starch are dissolved by the treatment with malt, and the low results in these particular cases may be due to these other substances, which may even possibly be formed during the process of digestion.

The reducing sugars formed from the hemi-celluloses exhibit quite marked variations in digestibility from 0 or less, to 92 per cent. This may be ascribed in part at least to the unsatisfactory character of this determination, due to the partial destruction of sugars already discussed. It may also be in part due to the production, during the fermentation in the intestines, of soluble products from materials previously insoluble.

The material rendered insoluble by acids is an indefinite group, and its digestibility varies. It is a question if much significance can be attached to this group. Pentosans were determined in a number of these insolubles, with the following results:

No.	Description.	Per Cent. Insoluble.	Per Cent. Pentosans.
3649	Vetch hay	5.94	0.79
3700	Excrement, vetch hay.....	3.21	.00
3877	Excrement, rice straw.....	5.88	.00
4249	Excrement, millet	7.07	.00
4254	Excrement, Bermuda	5.68	.00
4559	Excrement, corn shucks.....	7.52	.00
3609	Burr clover	6.44	0.94
3623	Excrement, burr clover.....	6.97	0.38
4238	Johnson grass hay.....	3.54	0.31
4240	Excrement, Johnson grass.....	7.59	0.43
4552	Guam grass	5.81	0.30
4554	Excrement, guam grass.....	11.69	0.29

The substances selected contained a high percentage of material made insoluble. If pentosans are made insoluble by the hydrochloric acid, their character is destroyed, so that they no longer yield furfural.

Nitrogen was also determined in some of the insolubles, and the results calculated to protein. Results are in the table:

No.	Description.	Per Cent. Insoluble.	Per Cent. Pentosans.
3258	Excrement, sorghum hav.....	8.90	1.56
3589	Excrement, Johnson grass.....	6.83	1.62
3595	Oat hay	3.73	1.14
3597	Excrement, oat hav.....	10.44	2.44
3625	Rice straw	2.21	0.50

No.	Description.	Per Cent. Insoluble.	Per Cent. Pentosans.
3883	Buffalo grass hay.....	2.27	0.60
4247	Millet	3.28	0.69
4252	Bermuda hay	2.63	0.70
3877	Excrement, rice straw.....	5.88	1.36
4249	Excrement, millet	7.07	4.30
4254	Excrement, Bermuda	5.68	3.38

This material, therefore, is composed for the most part of other substances than pentosans or protein.

The soluble residue is in some cases digested more, in others, less, than the total soluble nitrogen-free extract. This soluble residue includes the indefinite group of substances rendered insoluble by acids, and we cannot assume that they are rendered insoluble in quantitative proportions, but must await results of further experiments as to their nature.

The total soluble nitrogen-free extract (soluble in approximately N/50 acid and alkali) is digested to a greater extent than the insoluble nitrogen-free extract. There are some exceptions to this statement; namely, oat hay and alfalfa.

TABLE 4.—DIGESTIBLE CONSTITUENTS IN PERCENTAGE OF THE FOOD.

Lab. No.	Name of Feed.	Sugars		Starch.	Reducing sugar from hemi-cellulose.	Insoluble by acids.	Residue.	Total N. F. Extract Soluble.	Insoluble N. F. Extract.
		Mono.	Di.						
3277	Alfalfa hay used in Experiment No. 3.	1.81	.93	1.37	2.19	4.08	9.02	19.31	5.71
4252	Bermuda hay used in Experiment No. 12.	2.6	1.39	1.68				10.49	12.52
3609	Burr clover used in Experiment No. 6.	1.15	.09	1.57	2.02	4.53	8.02	20.85	3.39
3883	Buffalo Grass used in Experiment No. 9.	2.63	.82	3.70	0	2.09	2.24	12.05	14.19
4357	Corn shucks used in Experiment No. 17.	1.34	.17	1.86	5.95		3.99	15.88	16.58
3220	Cowpea hay used in Experiment No. 1.	1.20	1.21						
4352	Guam grass used in Experiment No. 16.	2.49	.56	.78		.26		14.42	13.90
3587	Johnson grass hay used in Experiment No. 4.	1.55	.06	.41	2.74	.42	5.51	9.34	11.89
4238	Johnson grass hay used in Experiment No. 10.	2.68	.58	1.80	0	.67	4.72	13.71	13.56
4540	Kafir fodder used in Experiment No. 15.	4.67	.58	1.25	0	.08	7.77	18.89	11.19
4247	Millet used in Experiment No. 11.	2.25	.92	8.22	7.91	.23	.01	19.93	8.24
3595	Oat hay used in Experiment No. 5.	2.23	.21	4.96	.20	.23	0	11.24	16.87
4259	Peanut hay used in Experiment No. 13.	2.21	2.13	3.43	0	3.66	14.35	30.48	
4277	Para grass used in Experiment No. 14.	4.08	.87		.48				8.66
3623	Rice straw, Japan, used in Experiment No. 7.	1.51	.15	5.66	1.44		1.65	7.20	9.44
4633	Rice straw, Honduras, used in Experiment No. 18.	.60	.07	1.13	2.71	0	5.33	8.69	10.34
3224	Sorghum hay used in Experiment No. 2.	4.85	.62	1.02				15.30	15.13
3649	Vetch hay used in Experiment No. 8.	.67	.52	1.80	2.88	4.74	7.57	17.82	6.40

SUGARS, ETC., BY $1\frac{1}{4}$ PER CENT. SULPHURIC ACID AND CAUSTIC SODA.

Only a limited amount of work was done along this line.

Methods.—The residue from the boiling with N/50 acid and alkali was returned to the beaker and boiled with $1\frac{1}{4}$ per cent. sulphuric acid as in the regular crude fiber method.

The *filtrate* was neutralized with caustic soda, made up to 400 c.c., 40 c.c. of hydrochloric acid 25 per cent added, and heated three hours in a boiling water bath. The *insoluble* was then determined on some of the materials. The solution was made up to 500 c.c. and reducing sugars determined by the Allihn method.

The residue was returned to the beaker and boiled with $1\frac{1}{4}$ per cent. caustic soda, as in the method for crude fiber. It was then filtered, and the filtrate neutralized with sulphuric acid and boiled with acid as described above. The insoluble was determined as described above. Nitrogen was determined in some of the insoluble products.

TABLE 5.—PERCENTAGE SUGARS, ETC., PRODUCED BY BOILING WITH ACIDS AND ALKALI.

Lab. No.		Sugars by 1-4 Sulphuric.	Insoluble precipitate from Acid.	Sugars by 1-4 Caustic.	Insoluble Precipitate from Alkali.	Protein insoluble from Alkali.	Insoluble Nitrogen Free Extract.
3224	Sorghum hay.....	8.55	0.59	1.67	11.12	.....	24.05
3258	Sorghum excrement.....	8.55	.....	2.25	.....	.....	23.83
3277	Alfalfa hay.....	3.15	.....	1.55	.....	.....	7.41
3279	Alfalfa excrement.....	7.45	.....	1.12	.....	.....	13.74
3587	Johnson grass hay.....	7.80	0.54	0.75	12.04	2.40	22.83
3581	Johnson grass excrement.....	11.50	0.57	1.23	4.67	0.93	22.79
3595	Oat hay.....	8.80	0.67	1.70	7.45	1.24	24.35
3597	Oat hay excrement.....	2.90	0.78	0.43	3.36	.....	20.39
3609	Burr clover.....	4.03	0.78	0.95	7.76	.....	7.41
3623	Burr clover excrement.....	11.23	0.80	0.33	4.76	75	13.76
3625	Rice straw.....	10.55	0.60	0.33	6.48	1.06	22.17
3649	Rice straw excrement.....	3.39	0.40	0.11	2.53	.....	21.82
3877	Vetch hay.....	5.65	0.57	0.28	4.05	.....	10.21
3780	Vetch hay excrement.....	12.00	0.41	.....	6.44	1.30	10.86
3883	Buffalo grass hay.....	9.10	.....	0.13	1.62	.....	25.71
4238	Buffalo grass excrement.....	10.65	0.48	0.45	6.57	.....	25.87
4240	Johnson grass hay.....	9.00	0.36	0.56	10.45	.....	23.50
4247	Johnson grass excrement.....	8.97	0.39	0.48	.....	.....	23.06
4249	Millet.....	10.30	0.70	0.43	4.33	0.70	18.27
4252	Millet excrement.....	15.50	0.59	1.03	8.35	1.36	23.97
4254	Bermuda.....	13.12	0.48	1.03	6.02	0.75	28.71
4259	Bermuda excrement.....	1.80	.....	1.20	8.80	1.54	31.19
4261	Peanut hay.....	4.40	.....	0.75	.....	.....	6.65
4546	Peanut hay excrement.....	10.10	.....	0.90	.....	.....	20.18
4548	Kafir fodder.....	10.30	0.35	0.35	.....	.....	20.35
4548	Kafir fodder excrement.....	12.45	0.45	0.45	.....	.....	25.43
4552	Guam grass.....	12.72	0.67	0.43	8.13	.....	26.89
4554	Guam grass excrement.....	12.72	0.67	0.43	9.43	.....	26.83
4557	Corn shucks.....	15.18	0.59	0.85	3.75	0.62	29.31
4559	Corn shucks excrement.....	11.90	0.25	0.85	7.17	.....	25.72
4663	Rice straw.....	10.00	.....	0.90	.....	.....	23.72
4666	Rice straw excrement.....	9.05	.....	0.85	.....	.....	23.36

Table 5 contains the results of this work expressed in percentage of the feed. Considerable quantities of sugars are produced by boiling with $1\frac{1}{4}$ per cent. sulphuric acid, and little insoluble material is formed during the hydrolysis with hydrochloric acid. The legumes produce much lower quantities of sugars, but contain less insoluble nitrogen-free extract.

Boiling with the $1\frac{1}{4}$ per cent. caustic soda produces only small quantities of sugars, but considerable quantities of insoluble precipitates are formed in the subsequent hydrolysis with acid. The precipitate contain some proteids, as shown in the table, but, after deducting this, large quantities remain, which make up comparatively large proportions of the feed. The nature of this precipitate and its mother substance requires further study.

TABLE 6.—PERCENTAGE SUGARS OF INSOLUBLE NITROGEN-FREE EXTRACT, ETC., PRODUCED BY BOILING WITH ACID AND ALKALI.

Lab. No.		Sugars by 1-4 per cent Sulphuric.	Sugars by 1-4 Caustic.	Insoluble precipitate from Alkali.	Protein insoluble from Alkali.	Total sugar extracted.
3224	Sorghum hay.....	35.55	6.94	46.65	.....	42.49
3258	Sorghum hay excrement.....	35.87	9.44	.....	.....	45.31
3277	Alfalfa hay.....	34.42	20.93	.....	.....	55.35
3279	Alfalfa hay excrement.....	22.93	8.15	.....	.....	31.08
3587	Johnson grass hay.....	32.63	3.29	.....	.....	35.92
3589	Johnson grass hay excrement.....	34.23	3.73	.....	10.53	37.96
3595	Oat hay.....	47.23	5.40	52.83	.....	52.63
3597	Oat hay excrement.....	43.16	6.03	19.18	3.82	49.19
3609	Burr clover.....	39.15	22.95	36.53	6.08	62.10
3623	Burr clover excrement.....	29.29	3.12	45.36	.....	32.41
3625	Rice straw.....	50.66	4.29	56.39	3.38	54.95
3877	Rice straw excrement.....	48.35	1.51	21.47	4.86	49.86
3879	Vetch hay.....	33.20	1.08	29.70	.....	34.28
3780	Vetch hay excrement.....	52.03	2.58	37.29	.....	54.61
3863	Buffalo grass.....	46.68	.....	25.05	5.06	.....
3885	Buffalo grass hay.....	35.17	0.50	6.26	.....	35.67
4238	Johnson grass hay.....	45.32	1.91	27.96	.....	47.23
4240	Johnson grass hay excrement.....	39.03	2.43	45.52	3.83	41.46
4247	Millet.....	49.09	2.63	23.70	5.67	51.72
4249	Millet excrement.....	42.97	1.79	34.83	5.67	44.76
4252	Bermuda.....	53.99	3.59	20.97	2.61	57.58
4254	Bermuda excrement.....	42.06	3.85	28.21	4.93	45.91
4259	Peanut hay.....	27.07	11.28	.....	.....	38.35
4261	Peanut hay excrement.....	21.80	2.97	24.77	.....	24.77
4546	Kafir fodder.....	49.63	1.71	.....	.....	51.34
4548	Kafir fodder excrement.....	40.50	1.77	.....	.....	42.27
4552	Guam grass.....	44.64	1.54	30.24	.....	46.18
4554	Guam grass excrement.....	47.40	2.46	35.15	.....	49.86
4557	Corn shucks.....	51.79	2.90	12.78	2.11	54.69
4559	Corn shucks excrement.....	46.27	2.53	27.87	.....	48.80
4663	Rice straw.....	42.16	3.58	.....	.....	45.74
4666	Rice straw excrement.....	38.74	3.85	.....	.....	42.59

Table 6 shows the percentage of sugars, etc., based upon the insoluble nitrogen-free extract as 100. This table brings out clearly the large proportion of sugars produced from the material dissolved by boiling 1.25 per cent. sulphuric acid, the small quantity from the material dissolved by boiling, 1.25 per cent. caustic soda, and the large quantity of insoluble precipitate from the material dissolved by alkali.

It is, of course, open to question whether all the reducing material formed in this process consists of sugars. It is also a question to be decided, whether the method employed secured the maximum quantity of sugars from the dissolved materials.

TABLE 7.—COEFFICIENTS OF DIGESTIBILITY AND QUANTITY DIGESTED OF SUGARS PRODUCED BY ACID AND ALKALI.

Lab. No.		Coefficient of Digestibility.			Quantity digested from 100 lbs. feed.		
		Insoluble Nitrogen Free Extract.	Sugars by 1-4 per cent Sulphuric.	Sugars by 1-4 per cent Caustic.	Insoluble Nitrogen Free Extract.	Sugars by 1-4 per cent Sulphuric.	Sugars by 1-4 per cent Alkali.
3224	Sorghum hay.	62.9	65.8	58.5	15.15	5.63	.98
3277	Alfalfa hay.	77.1	53.7	72.4	5.71	1.37	1.12
3587	Johnson grass hay.	32.1	49.7	45.7	11.89	3.70	.78
3595	Oat hay.	69.3	72.6	64.2	16.87	8.35	.79
3609	Burr clover.	45.8	61.6	63.0	3.39	1.79	1.76
3625	Rice straw.	42.9	37.3	80.5	8.44	5.31	.76
3649	Vetch hay.	62.7	37.9	6.8	6.40	7.03	.01
3883	Buffalo grass hay.	55.2	66.0	50.9	14.18	7.72	.....
4238	Johnson grass hay.	57.7	56.7	62.8	13.56	7.10	.33
4247	Millet.	45.1	52.3	62.8	13.23	8.89	.42
4252	Bermuda.	43.9	57.9	40.8	12.52	6.84	.52
4258	Peanut hay.	53.3	20.7	74.0	.....	6.37	.18
4456	Kafir fodder.	55.0	61.4	51.8	11.19	6.30	.19
4552	Guam grass.	51.7	50.6	67.0	13.09	8.39	1.1
4557	Corn stalks.	53.5	66.4	67.0	16.88	10.53	.82
4663	Rice straw.	43.6	50.1	41.6	10.34	5.01	.35

Table 7 contains the coefficients of digestibility of the sugars produced, and also the quantities of digestible sugars formed.

An examination of this table shows considerable digestible material which is not reduced to the sugar form. It is, of course, true that there is probably a loss in transforming the carbohydrates present to sugars. On the other hand, it is probable that a considerable portion of the deficiency is due to the presence of substances other than carbohydrates.

This work is being continued.

TABLE 8.—COMPOSITION OF EXCREMENTS.

Lab. No.		Sugars		Starch	Pentosans in N. F. Extract.	Reducing sugars from hemi-cellulose.	Rendered insoluble by acid.	Total except sugars from hemi-cellulose.	Residue.	Total N. F. Extract, soluble.	Insoluble N. F. Extract.	Total N. F. Extract.
		Mono.	Di.									
3222	Excement sheep 2	0.29	0.03	0.05	3.71	2.64	8.90	13.55	5.60	19.15	23.83	27.65
3223	Excement sheep 3	0.32	0.02	0.03	2.82	2.54				19.77	23.63	28.28
3256	Excement sheep 1	0.05	0.19	0.70	2.91	2.62				19.93	23.73	43.40
3259	Excement sheep 2	0.02	0.03	0	3.93	3.61	1.76	6.01	8.03	14.04	13.74	43.66
3260	Excement sheep 3	0.04	0	0	3.65	3.55				14.26	14.24	27.78
3279	Excement sheep 2	0.02	0.01	0.29	3.84	3.75				14.00	14.08	28.50
3280	Excement sheep 3	0.10	0.04	0.81	2.94	2.66	6.83	11.24	8.65	19.89	22.79	28.08
3281	Excement sheep 4	0.10	0.08	1.42	4.49	3.33				20.50	22.47	42.68
3289	Excement sheep 1	0.04	0.01	1.45	4.87	2.82				20.15	23.04	43.19
3290	Excement sheep 3	0.03	0.02	1.16	3.51	3.22	10.44	14.18	15.40	29.58	20.39	49.97
3291	Excement sheep 4	0.07	0.01	1.18	2.70	3.49				20.24	21.27	41.51
3297	Excement sheep 1	0.03	0.03	1.10	3.61	3.96	6.97	11.50	2.47	13.97	13.76	27.73
3298	Excement sheep 2	0.08	0.12	1.72	3.91	4.24				12.51	15.26	27.77
3623	Excement sheep 3	0.04	0.02	0.70	3.28	3.09	5.88	9.58	5.10	14.68	21.82	36.50
3877	Excement sheep 2	0.05	0.01	0.35	3.20	3.15				14.18	23.12	37.30
3878	Excement sheep 3	0.06	0.01	0.35	3.49	4.30				14.75	22.78	37.53
3879	Excement sheep 4	0.08	0.01	0.21	4.06	3.36	3.21	7.57	17.29	24.86	10.86	35.72
3700	Excement sheep 1	0.08	0.01	0.77	3.89	3.34	3.75	8.50	7.42	15.92	25.87	41.79
3885	Excement sheep 2	0.05	0.06	0.86	4.21	3.62				15.91	25.55	41.46
3886	Excement sheep 3	0.06	0.06	0.36	3.12	4.12				15.70	26.14	41.84
3887	Excement sheep 4	0.07	0.02	0.36	3.21	3.95	7.59	11.08	7.80	18.88	23.06	41.94
4240	Excement sheep 1	0.09	0.01	0.18	3.21	3.88				18.71	26.39	45.10
4241	Excement sheep 2	0.11	0.01	0.25	2.96	3.93				19.53	26.97	46.50
4242	Excement sheep 3	0.10	0.05	0.25	2.65	3.24	7.17	18.01	5.79	23.80	23.07	46.80
4249	Excement sheep 1	0.13	0.24	7.14	3.33	2.24				24.93	23.15	48.08
4250	Excement sheep 3	0.29	0.06	9.05	4.20	2.20				21.18	33.13	45.37
4251	Excement sheep 4	0.28	0.14	7.48	2.76	2.33	5.88	10.07	4.11	14.18	32.28	46.45
4254	Excement sheep 1	0.06	0.01	0.79	3.53	2.91				13.30	20.18	33.48
4255	Excement sheep 2	0.08	0.02	0.67	4.24	2.91				14.23	20.18	34.41
4256	Excement sheep 3	0.08	0.08	0.91	3.61	1.45	0.93	3.19	5.94	9.23	20.32	29.55
4261	Excement sheep 4	0.07	0.23	0.93	1.36	1.34				8.24	20.12	28.36
4262	Excement sheep 1	0.20	0.07	0.77	1.72	1.63				8.08	20.92	29.00
4263	Excement sheep 3	0.23	0.10	0.04	1.89	4.48				19.04	26.92	45.96
4270	Excement sheep 4	0.16	0.01	0.02	4.45	4.48				20.00	27.04	47.07
4280	Excement sheep 1	0.08	0.08	0.30	5.35	4.48				18.68	27.18	45.86
4281	Excement sheep 3	0.08	0.00	0.40	5.11	3.44				18.49	25.93	44.43
4284	Excement sheep 4	0.06	0.01	0.16	2.80	2.80	6.50	9.01	6.48	18.49	25.93	44.43
4548	Excement sheep 3	0.07	0.06	0.20	2.76	2.76				18.53	22.47	41.00
4550	Excement sheep 4	0.06	0.02	0.21	2.76	2.76				18.53	22.47	41.00
4554	Excement sheep 1	0.03	0.01	0.91	2.63	2.60	11.69	15.37	5.16	20.53	26.83	47.36

4555	Excrement sheep 3	.07	.02	.68	4.62	3.16	.....	.....	20.70	27.16	47.86
4556	Excrement sheep 5	.06	.02	.58	4.92	2.77	.....	.....	19.85	26.45	46.50
4558	Excrement sheep 1	.09	.00	.32	7.32	7.65	15.31	8.82	27.13	26.57	49.95
4559	Excrement sheep 5	.07	.01	.52	5.35	5.43	.....	.....	23.52	27.72	49.55
4560	Excrement sheep 5	.06	.01	.52	4.90	5.04	.....	.....	23.52	26.99	50.55
4561	Excrement sheep 1	.08	.15	.98	3.30	2.00	9.97	4.85	17.82	26.38	50.18
4563	Excrement sheep 5	.22	0.15	.83	3.59	2.00	.....	.....	17.42	23.76	39.18
4566	Excrement sheep 5	.09	.13	1.32	3.00	1.86	.....	.....	13.88	23.76	39.18
4567	Excrement sheep 5	.09	.13	1.32	3.00	1.86	.....	.....	13.88	24.77	38.65

TABLE 9.—NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD.

	Sugars		Starch.	Reduc- ing sugar from hemi- cellulose.	Ren- dered in- soluble by acid.	Residue.	Total N. F. E. soluble.	Insoluble N. F. E.	Sugar by 1:4 sul- phuric.	Sugar by 1:4 per cent caustic.	Insoluble preci- pitate from caustic.
	Mono.	Di.									
Digestion Period No. 1 with Cowpea Hay.											
Sheep No. 1—											
Fed 4000 gms. No. 3220-1.....	53.20	48.8									
Eaten 1729 gms. No. 3222.....	5.0	0.5									
Digested.....	48.2	48.3									
Percentage digested from cowpea hay.....	90.6	98.9									
Sheep No. 2—											
Total fed 4000 gms. No. 3220-1.....	53.20	48.8									
Eaten 1687 gms. No. 3223.....	53.2	48.8									
Excreted 1687 gms. No. 3223.....	5.4	3.3									
Digested.....	47.6	48.5									
Percentage digested from cowpea hay.....	89.5	99.3									
Average percentage digested.....	90.1	99.1									
Digestion Period No. 2 with Sorghum Hay.											
Sheep No. 1—											
Fed 4800 gms. No. 3224-5.....	233.3	31.2	61.9	19.2	174.2	391.2	1091.5	1154.0	410.4	80.2	
Eaten 1860 gms. No. 3224-5.....	9	3.5	13.0	49.1	165.5	104.2	356.2	443.2	159.0	41.9	
Excreted 1860 gms. No. 3258.....											
Digested.....	232.4	27.7	48.9	0	8.7	287.0	735.3	711.2	251.4	38.3	
Percentage digested from Sorghum hay.....	99.6	88.9	78.9	0	4.9	73.3	67.3	61.6	61.3	47.8	
Sheep No. 2—											
Total fed 4000 gms. No. 3224-5.....	194.4	26.0	51.6	16.0			909.6	962.0	342.0	66.8	
Eaten 1560 gms. No. 3259.....	3	5	10.5	39.6			308.4	358.6	133.4	35.1	
Excreted 1560 gms. No. 3259.....											
Digested.....	194.1	25.5	41.1	0			601.2	603.4	208.6	31.7	
Percentage digested from sorghum hay.....	99.8	98.1	79.6	0			66.1	62.7	61.0	47.5	

Sheep No. 3—											
Fed 4000 gms. No. 3224-5.	194.4	28.0	51.6	16.00	145.2	328.0	909.6	962.0	342.0	66.8	.....
Residue 5 gms. No. 3224-5.	.2	0	.1	0	.2	.4	1.1	1.2	.4	.1	.....
Eaten.....	194.2	28.0	51.5	16.0	145.0	325.6	908.5	960.8	341.6	66	.....
E'creted 1440 gms. No. 3260.	.6	.1	10.9	37.7	.....	.....	287.0	341.7	125.1	32.4	.....
Digested.....	193.6	25.9	40.6	0	.....	.....	621.5	619.1	218.5	34.3	.....
Percentage digested.....	99.7	99.6	78.8	0	.....	.....	68.4	64.4	64.0	51.3	.....
Digestion Period No. 3 with Alfalfa Hay.											
Sheep No. 2—											
Fed 4400 gms. No. 3277-8.	81.0	41.8	64.2	156.2	209.0	531.1	837.7	1004.5	112.2	68.2	.....
Residue 3 gms. No. 3277-8.	.1	0	.1	.1	.1	.4	.8	.2	.1	0	.....
Eaten.....	80.9	41.8	64.1	156.1	208.9	530.7	836.9	1004.3	112.1	68.2	.....
E'creted 1667 gms. No. 3279.	.3	.2	4.8	60.2	29.3	133.9	249.6	229.0	52.5	18.7	.....
Digested.....	80.6	41.6	59.3	95.9	179.6	396.8	587.3	775.3	59.6	49.5	.....
Percentage didigested.....	99.5	99.5	92.5	61.4	85.9	74.7	70.2	77.2	53.2	72.6	.....
Sheep No. 3—											
Total fed 4400 gms. No. 3277-8.	81.0	41.8	64.2	156.2	.....	.....	837.7	1004.5	112.2	68.2	.....
E'creted 1511 gms. No. 3280.	1.5	.6	4.7	53.6	.....	.....	215.5	215.3	47.6	16.9	.....
Digested.....	79.5	41.2	59.5	102.6	.....	.....	622.2	789.2	64.6	51.3	.....
Percentage digested.....	98.1	98.5	92.7	65.7	.....	.....	74.3	78.6	57.6	75.2	.....
Sheep No. 4—											
Fed 4400 gms. No. 3277-8.	81.0	41.8	64.2	156.2	.....	.....	837.7	1004.5	112.0	68.0	.....
Residue 86 gms. No. 3283.	1.6	.8	1.3	3.1	.....	.....	23.2	7.4	2.2	1.3	.....
Eaten.....	79.4	41.0	62.9	153.3	.....	.....	814.5	997.1	109.8	66.9	.....
E'creted 1732 gms. No. 3281.	1.7	1.4	2.4	64.9	.....	.....	242.5	243.9	54.6	19.4	.....
Digested.....	77.7	39.6	60.5	88.4	.....	.....	572.0	753.2	55.2	47.5	.....
Percentage digested.....	97.8	96.6	96.2	57.6	.....	.....	70.2	75.5	50.3	71.0	.....
Average percentage digested.....	98.5	98.2	93.8	61.6	85.9	74.7	71.6	77.1	53.7	72.9	.....
Digestion Period No. 4 with Johnson Grass Hay.											
Sheep No. 1—											
Fed 3600 gms. No. 3587-8.	56.5	2.5	38.1	146.2	136.4	246.2	685.8	821.9	268.2	27.0	.....
Residue 110 gms. No. 3592.	1.7	.1	1.2	4.5	4.2	7.5	20.9	25.1	8.2	.8	.....
Eaten.....	54.8	2.4	36.9	141.7	132.2	238.7	664.5	796.8	260.0	26.2	.....
E'creted 1720 gms. No. 3589.	.7	.2	24.4	35.8	117.5	148.8	342.1	392.0	134.2	14.6	.....
Digested.....	54.1	2.2	12.5	105.9	14.7	89.9	322.4	404.8	125.8	11.6	.....
Percentage digested.....	98.7	91.3	33.5	74.7	11.1	37.6	48.5	50.8	48.4	44.3	.....

TABLE 2.—NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD.

	Sugars		Starch.	Reduc- ing sugar from hemi- cellulose.	Ren- dered in- soluble by acid.	Residue.	Total N. F. E. soluble.	Insoluble N. F. E.	Sugar by 1-4 per cent sul- phuric.	Sugar by 1-4 per cent caustic.	Insoluble precip- itate from caustic.
	Mono.	Di.									
Digestion Period No. 3 with Johnson Grass Hay.											
Sheep No. 3—											
Total fed 3600 gms. No. 3587-8.	56.5	2.5	38.1	146.2			685.4	821.9	268.2	27.0	
Residue 471 gms. No. 3593.	7.4	.3	5.0	19.1			89.7	107.5	35.1	3.5	
Eaten.	49.1	2.2	33.1	127.1			595.7	714.4	233.1	23.5	
Excreted 1476 gms. No. 3590.	.4	.3	21.4	49.7			302.6	331.7	115.1	12.5	
Digested.	48.7	1.9	11.7	77.4			293.1	382.7	118.0	11.0	
Percentage digested.	99.2	86.4	35.3	60.9			49.2	53.6	50.6	46.8	
Sheep No. 4—											
Fed 3600 gms. No. 3587-8.	56.5	2.5	38.1	146.2			685.4	821.9	268.2	27.0	
Residue 158 gms. No. 3594.	2.5	.1	1.7	6.4			30.1	36.1	11.8	1.3	
Eaten.	54.0	2.4	36.4	139.8			655.3	785.8	256.4	25.7	
Excreted 1637 gms. No. 3591.	1.1	.2	19.0	46.2			329.8	377.2	127.7	13.9	
Digested.	52.9	2.2	17.4	83.6			325.5	408.6	128.7	11.8	
Percentage digested.	97.9	91.6	47.8	66.9			49.6	51.9	50.2	45.9	
Average percentage digested.	98.6	89.9	38.9	67.5	11.1	37.6	49.1	52.1	49.7	45.7	
Digestion Period No. 5 with Oat Hay.											
Sheep No. 1—											
Fed 4000 gms. No. 3595-6.	89.6	12.0	200.4	55.6	149.2	187.2	801.6	974.0	460.0	49.2	186.8
Residue 173 gms. No. 3599.	3.9	.5	8.7	2.4	6.8	8.1	34.7	42.1	19.9	2.1	8.1
Eaten.	85.7	11.5	191.7	53.2	142.4	179.1	766.9	931.9	440.1	47.1	178.7
Excreted 1281 gms. No. 3597.	.4	.3	2.3	41.2	133.6	197.1	378.6	261.0	112.7	15.8	95.4
Digested.	85.3	11.2	189.4	12.0	8.8	0	388.3	670.9	327.4	31.3	83.3
Percentage digested.	99.5	97.4	98.8	22.5	6.2	0	50.6	71.9	74.4	66.4	46.6

Sheep No. 4—											
Total fed 4000 gms. No. 3595-6.	89.6	12.0	200.4	55.6	.....	801.6	974.0	460.0	49.2	186.8	.....
Residue 242 gms. No. 3600.	5.4	7	12.1	3.4	.....	48.5	58.9	27.8	3.0	11.3	.....
Eaten.....	84.2	11.3	188.3	52.2	.....	753.1	915.1	432.2	46.2	175.5	.....
Excreted 1433 gms. No. 3598.	6	4	1.4	48.6	.....	280.0	304.8	126.1	17.6	106.8	.....
Digested.....	83.6	10.9	186.9	3.6	.....	463.1	610.3	306.1	28.6	68.7	.....
Percentage digested.....	99.3	96.4	99.3	6.9	.....	61.5	66.6	70.8	61.9	39.1	.....
Average percentage digested.....	99.4	96.9	99.1	14.7	6.2	0	69.3	72.6	64.2	42.9	.....
Digestion Period No. 6 with Burr Clover Hay.											
Fed 4000 gms. No. 3604-10.	46.8	4.4	76.0	126.0	257.6	348.0	296.4	116.0	68.0	134.4	.....
Residue 5 gms. No. 3609-10.	1	0	1	2	3	4	1.2	1	1	2	.....
Eaten.....	46.7	4.4	75.9	125.8	257.3	347.6	296.0	115.9	67.9	134.2	.....
Excreted 1096 gms. No. 3623.	9	1.3	18.9	43.4	76.4	27.1	150.8	44.2	4.7	85.0	.....
Digested.....	45.8	3.1	57.0	81.4	180.9	320.5	825.7	145.2	71.7	49.	.....
Percentage digested.....	98.2	70.5	75.1	65.5	70.3	9.2	84.4	61.9	93.1	36.7	.....
Sheep No. 3—											
Total fed 4000 gms. No. 3609-10.	46.8	4.4	76.0	126.0	.....	980.0	296.4	116.0	68.0	134.4	.....
Residue 15 gms. No. 3609-10.	2	0	3	5	.....	3.7	1.1	4	3	5	.....
Eaten.....	46.6	4.4	75.7	125.5	.....	976.3	295.3	115.6	67.7	133.9	.....
Excreted 1110 gms. No. 3624.	4	2	7.8	47.0	.....	138.9	169.4	44.7	4.8	86.1	.....
Digested.....	46.2	4.2	67.9	78.5	.....	837.4	125.9	70.9	62.9	47.8	.....
Percentage digested.....	99.1	95.4	89.7	82.5	.....	85.7	42.6	61.3	92.9	35.7	.....
Average percentage digested.....	98.7	82.9	82.4	64.0	70.3	92.2	85.1	61.6	93.0	36.2	.....
Digestion Period No. 7 with Rice Straw.											
Fed 3600 gms. No. 3625-6.	55.8	54.0	212.4	111.2	79.6	111.2	798.2	404.2	34.2	171.4	.....
Residue 53 gms. No. 3680.	8	1	3.1	1.6	1.2	1.6	11.8	6.0	3.5	2.5	.....
Eaten.....	55.0	53.9	209.3	109.6	78.8	209.6	786.4	398.2	33.7	169.9	.....
Excreted 1914 gms. No. 3877.	1.2	2	6.7	59.1	112.5	97.6	417.6	201.9	6.3	124.0	.....
Digested.....	53.8	53.7	202.6	50.5	0	112.0	368.8	196.3	27.4	44.9	.....
Percentage digested.....	97.8	99.8	96.8	46.1	0	53.4	46.7	49.3	81.3	26.6	.....
Sheep No. 3											
Total fed 3600 gms. No. 3625-6.	55.8	54.0	212.4	111.2	.....	55.6	798.2	404.2	34.2	171.4	.....
Residue 305 gms. No. 3681.	4.7	5	18.0	9.4	.....	46.8	67.6	34.3	2.9	14.5	.....
Eaten.....	51.1	53.5	194.4	101.8	.....	505.8	730.6	369.9	31.3	156.9	.....
Excreted 1933 gms. No. 3878.	1.2	2	10.8	60.9	.....	274.1	44.6	203.9	6.4	125.3	.....
Digested.....	49.9	53.3	183.6	40.9	.....	231.7	283.7	166.0	24.9	31.6	.....
Percentage digested.....	97.6	99.6	94.4	40.2	.....	45.8	38.8	44.9	79.6	20.1	.....

TABLE 9.—NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD.

	Sugars		Starch.	Reduc- ing sugar from hemi- cellulose.	Ren- dered in- soluble by acid.	Residue.	Total N. F. E. soluble.	Insoluble N. F. E.	Sugar by 1-4 per cent sul- phuric.	Sugar by 1-4 per cent caustic.	Insoluble precip- itate from caustic.	
	Mono.	Di.										
Digestion Period No. 7 with Rice Straw.												
Sheep No. 4—												
Fed 3600 gms. No. 3625-6.	55.8	54.0	212.4	111.2			552.6	798.2	404.2	34.2	171.4	
Residue 170 gms. No. 3882.	2.6	3	10.0	5.2			26.1	37.7	19.1	1.6	8.1	
Eaten.	53.2	53.7	202.4	106.0			526.5	760.5	585.1	32.6	163.6	
Excreted 1912 gms. No. 3879.	1.5	7	6.7	48.8			282.0	434.2	201.7	6.3	123.9	
Digested.	51.7	53.5	195.7	57.2			244.5	326.3	183.4	26.3	39.4	
Percentage digested.	97.2	99.6	96.6	53.9			46.4	42.9	47.6	80.7	24.1	
Average percentage digested.	97.5	99.7	95.9	46.7		53.4	46.9	42.6	47.3	80.5	23.6	
Digestion Period No. 8 with Vetch Hay.												
Sheep No. 1—												
Fed 4000 gms. No. 3649-50.	28.0	12.8	35.2	179.2	237.6	560.8	1083.4	408.4	135.6	4.4	100.8	
Eaten.	28.0	12.8	35.2	179.2	237.6	560.8	1083.6	408.4	135.6	4.4	100.8	
Excreted 1491 gms. No. 3700.	1.2	1.1	3.1	64.1	47.8	257.8	370.7	152.2	84.2	4.1	60.4	
Digested.	26.8	12.7	32.1	115.1	89.8	303.0	712.9	256.2	51.4	3	40.4	
Percentage digested.	95.7	99.2	91.2	64.2	79.8	54.0	65.8	62.7	37.9	6.8	40.1	
Average percentage digested.	95.7	99.2	91.2	64.2	79.8	54.0	65.8	62.7	37.9	6.8	40.1	
Digestion Period No. 9 with Buffalo Grass Hay.												
Sheep No. 3—												
Fed 4000 gms. No. 3883-4.	106.4	33.6	162.8	15.6			766.4	1028.4	480.0		257.6	
Eaten.	106.3	33.6	162.6	15.6			765.4	1027.1	479.4		257.3	
Excreted 1881 gms. No. 3886.	1.1	1.1	16.2	68.1			299.3	480.6	171.2	2.4	30.5	
Digested.	105.2	32.5	146.4	0			466.1	546.5	308.2		226.8	
Percentage digested.	98.9	96.7	90.0	0			60.7	53.2	64.3		88.2	

Sheep No. 2—											
Total fed 4000 gms. No. 3883-4.....	106.4	33.6	162.8	15.6	90.8	175.6	776.4	1028.4	480.0	.....	257.6
Excreted 1701 gms. No. 3885.....	1.4	.....	13.1	56.8	63.8	126.1	270.8	440.0	154.8	.....	27.6
Digested.....	105.0	33.4	149.7	0	27.0	49.5	505.6	588.4	325.2	.....	230.0
Percentage digested.....	98.7	99.4	91.9	0	91.9	28.2	65.1	57.2	67.7	.....	89.3
Average percentage digested.....	98.8	98.1	91.0	0	91.9	28.2	62.9	55.2	66.0	.....	88.6
Digestion Period No. 10 with Johnson Grass Hay.											
Fed 4000 gms. No. 4238-9.....	108.8	23.6	75.6	34.4	141.6	306.8	849.2	940.0	426.0	18.0	262.8
Residue 16 gms. No. 4238-9.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Eaten.....	108.6	23.5	75.4	34.3	141.2	306.0	847.1	937.6	424.9	18.0	262.1
Excreted 1512 gms. No. 4240.....	1.4	.....	2.7	59.6	114.6	117.8	285.5	348.7	136.1	8.5	158.0
Digested.....	107.2	23.2	72.7	0	26.6	188.2	561.6	588.9	288.8	9.5	104.1
Percentage digested.....	98.7	99.1	96.8	0	18.8	61.5	66.3	62.8	68.0	52.8	39.7
Sheep No. 3—											
Total fed 4000 gms. No. 4238-9.....	108.8	23.6	75.6	34.4	.....	.....	849.2	940.0	426.0	18.0	262.8
Residue 5 gms. No. 4238-9.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Eaten.....	108.7	23.6	75.5	34.4	.....	.....	848.1	938.8	425.5	18.0	262.5
Excreted 1577 gms. No. 4241.....	1.7	.....	4.1	61.3	.....	.....	295.1	416.2	141.9	8.8	164.8
Digested.....	107.0	23.4	71.4	0	.....	.....	553.0	522.6	283.6	9.2	97.7
Percentage digested.....	98.4	99.1	94.6	0	.....	.....	65.2	55.6	66.6	51.1	27.2
Sheep No. 4—											
Fed 4000 gms. No. 4238-9.....	108.8	23.6	75.6	34.4	.....	.....	849.2	940.0	426.0	18.0	262.8
Residue 5 gms. No. 4238-9.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Eaten.....	108.7	23.6	75.5	34.4	.....	.....	848.1	938.8	425.5	18.0	262.5
Excreted 1634 gms. No. 4242.....	1.6	.....	4.1	64.1	.....	.....	319.1	426.0	147.1	9.2	170.8
Digested.....	107.1	22.8	71.4	0	.....	.....	529.0	512.8	278.4	8.8	91.7
Percentage digested.....	98.5	96.6	94.5	0	.....	.....	62.3	54.6	65.4	48.9	34.9
Average percentage digested.....	98.5	98.3	95.2	0	18.8	61.5	64.6	57.7	66.7	50.9	33.9
Digestion Period No. 11 with Baled Millet.											
Fed 4000 gms. No. 4247-8.....	94.0	39.2	459.6	344.4	131.2	98.8	1184.8	730.8	358.8	19.2	173.2
Residue 34 gms. No. 4247-8.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Eaten.....	93.2	38.9	455.5	341.5	130.1	98.0	1174.8	724.6	355.8	19.0	171.7
Excreted 1686 gms. No. 4249.....	2.2	4.1	120.4	37.8	120.9	97.6	401.3	404.2	173.7	7.2	140.8
Digested.....	91.0	34.8	335.1	303.7	9.2	.....	773.5	320.4	182.1	11.8	30.9
Percentage digested.....	97.6	89.4	73.6	88.9	7.1	0.4	65.8	44.2	51.2	62.1	18.0

TABLE 9.—NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD.

	Sugars		Starch.	Reducing sugar from hemi-cellulose.	Re-rendered insoluble by acid.	Residue.	Total N. F. E. soluble.	Insoluble N. F. E.	Sugar by 1-4 per cent sal-phuric.	Sugar by 1-4 per cent caustic.	Insoluble precipitate from caustic.
	Mono.	Di.									
Digestion Period No. 11 with Baled Millet.											
Sheep No. 3—											
Total fed 4000 gms. No. 4247-8.	94.0	39.2	459.6	344.4			1184.8	730.8	358.8	19.2	173.2
Residue 20 gms. No. 4247-8.	.5	.2	2.3	1.7			5.9	3.8	1.8	.1	.9
Eaten.	93.5	39.0	457.3	342.7			1178.9	727.0	357.0	19.1	172.3
Excreted 1564 gms. No. 4250.	4.5	.9	142.5	34.3			390.0	360.8	161.1	6.7	130.6
Digested.	89.0	38.1	314.8	308.4			788.9	366.2	195.9	12.4	41.7
Percentage digested.	95.2	97.7	68.8	89.9			66.9	50.3	54.9	64.9	24.2
Sheep No. 4—											
Fed 4000 gms. No. 4247-8.	94.0	39.2	459.6	344.4			1184.8	730.8	358.8	19.2	173.2
Residue 30 gms. No. 4247-8.	.7	.3	3.4	2.6			8.9	5.5	2.7	.1	1.3
Eaten.	93.3	38.9	456.2	341.8			1176.9	725.3	356.1	19.1	171.9
Excreted 1704 gms. No. 4251.	4.8	2.4	127.2	10.9			360.9	428.6	175.5	7.3	142.3
Digested.	88.5	36.5	329.0	330.9			816.0	296.7	180.6	11.8	29.6
Percentage digested.	94.8	93.8	72.1	96.8			69.3	40.9	50.7	61.5	17.2
Average percentage digested.	95.9	93.6	71.5	91.9	7.1	0.4	67.3	45.1	52.3	62.8	19.8
Digestion Period No. 12 with Bermuda Hay.											
Sheep No. 1—											
Fed 4000 gms. No. 4252-3.	88.0	56.4	43.2	28.4	105.2	235.6	702.0	1148.4	620.0	41.2	240.8
Residue 12 gms. No. 4252-4.	.3	.2	.1	.1	.3	.7	2.1	3.4	1.9	.1	.7
Eaten.	87.7	56.2	43.1	28.3	104.9	234.9	699.9	1145.0	618.1	41.1	240.1
Excreted 1920 gms. No. 4254.	1.2	.2	15.2	44.7	109.1	78.9	272.3	598.8	251.9	23.0	169.0
Digested.	86.5	56.0	27.9			156.0	427.6	546.2	366.2	18.1	71.1
Percentage digested.	98.6	99.6	64.7	0	0	66.4	61.1	47.7	59.2	44.0	29.6

Sheep No. 3—											
Total fed 4000 gms. No. 4252-3.	88.0	56.4	43.2	28.4	.....	.....	702.0	1148.4	620.0	41.2	240.8
Residue 12 gms. No. 4252-4.	.3	.2	.1	.1	.....	.....	2.1	3.1	1.9	.1	.7
Eaten.....	87.7	56.2	43.1	28.3	.....	.....	699.9	1145.3	618.1	41.1	240.1
Excreted 2110 gms. No. 4255.	1.7	.4	14.1	61.4	.....	.....	280.6	677.9	276.8	25.3	185.7
Digested.....	86.0	55.8	29.0	0	.....	.....	419.3	467.4	341.3	15.8	54.4
Percentage digested.....	98.1	99.3	67.3	0	.....	.....	59.9	40.8	55.2	38.4	22.7
Sheep No. 3—											
Fed 4000 gms. No. 4252-3.	88.0	56.4	43.2	28.4	.....	.....	702.0	1148.4	620.0	41.2	240.8
Residue 15 gms. No. ....	.3	.2	.2	.1	.....	.....	2.6	4.3	2.3	.2	.9
Eaten.....	87.7	56.2	43.0	28.3	.....	.....	699.4	1144.1	617.7	41.0	239.9
Excreted 2044 gms. No. 4256.	1.4	1.6	18.6	29.6	.....	.....	290.9	659.8	268.2	24.5	179.9
Digested.....	86.3	54.6	24.4	0	.....	.....	408.5	484.3	349.5	16.5	60.0
Percentage digested.....	98.4	97.1	56.7	.....	.....	.....	58.4	42.3	56.6	40.2	25.0
Average percentage digested.....	98.4	98.7	62.9	0	.....	.....	59.8	43.6	57.0	40.9	25.8
Digestion Period No. 13 with Peanut Hay.											
Sheep No. 1—											
Fed 4000 gms. No. 4259-60.	90.8	87.2	138.0	14.4	158.8	653.2	1329.6	266.0	72.0	30.0	.....
Excreted 1335 gms. No. 4261.	2.7	3.1	.4	17.8	12.4	78.5	121.9	269.4	58.7	8.0	.....
Digested.....	88.1	84.1	137.6	0	146.4	574.7	1207.5	0	13.3	22.0	.....
Percentage digested.....	97.0	96.4	99.7	.....	92.2	87.9	90.8	.....	18.5	73.3	.....
Sheep No. 3—											
Total fed 4000 gms. No. 4259-60.	90.8	87.2	138.0	14.4	.....	.....	1329.6	266.0	72.0	30.0	.....
Excreted 1246 gms. No. 4262.	2.9	.9	.9	17.0	.....	.....	103.0	240.9	54.8	7.5	.....
Digested.....	87.9	86.3	137.1	0	.....	.....	1226.6	25.1	17.2	22.5	.....
Percentage digested.....	96.8	98.9	99.3	0	.....	.....	92.2	9.4	23.9	75.0	.....
Sheep No. 4—											
Fed 4000 gms. No. 4259-60.	90.8	87.2	138.0	14.4	.....	.....	1329.6	266.0	72.0	30.0	.....
Excreted 1315 gms. No. 4263.	2.1	1.3	.5	21.4	.....	.....	106.3	264.6	57.9	7.9	.....
Digested.....	88.7	85.9	137.5	0	.....	.....	1223.3	1.4	14.1	22.1	.....
Percentage digested.....	97.7	98.5	99.6	0	.....	.....	92.0	.....	19.6	73.7	.....
Average percentage digested.....	97.2	97.9	99.5	0	92.2	87.9	91.7	3.3	20.7	74.0	.....

TABLE 9.—NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD.

	Sugars		Starch.	Reduc- ing sugar from hemi- cellulose.	Ren- dered in soluble by acid.	Residue.	N. F. E. soluble.	Insoluble N. F. E.	Sugars by 1-4 per cent sul- phuric.	Sugars by 1-4 per cent caustic.	Insoluble precipi- tate from caustic.
	Mono.	Di.									
Digestion Period No. 14 with Para Grass.											
Sheep No. 1											
Fed 4000 gms. No. 4277-8.	174.0	35.2		108.0			922.8	924.0			
Residue 212 gms. No. 4282.	9.2	1.9		5.7			27.7	49.0			
Sheep No. 2											
Eaten.	164.8	33.3		103.3			895.1	875.0			
Excreted 2043 gms. No. 4279.	1.6	.2	.4	91.4			389.0	550.0			
Digested.	163.2	33.1		11.9			506.1	325.0			
Percentage digested.	99.0	99.4		11.5				37.1			
Sheep No. 3—											
Total fed 4000 gms. No. 4277-8.	174.0	35.2		108.0			922.8	924.0			
Residue 40 gms. No. 4283.	1.7	.4		1.1			5.2	9.2			
Sheep No. 4—											
Eaten.	172.3	34.8		106.9			917.6	914.8			
Excreted 2175 gms. No. 4280.	1.7	0.0		97.4			435.7	587.9			
Digested.	170.6	34.8		9.5			481.9	326.9			
Percentage digested.	99.0	100.0		8.8				35.7			
Sheep No. 4—											
Fed 4000 gms. No. 4277-8.	174.0	35.2		104.0			922.8	924.0			
Residue 648 gms. No. 4287.	28.2	5.7		17.5			84.7	149.7			
Eaten.	145.8	29.5		90.5			838.1	774.3			
Excreted 1751 gms. No. 4281.	1.1	.2		60.2			327.1	475.9			
Digested.	144.7	29.3		30.3			511.0	298.4			
Percentage digested.	83.1	99.3		33.4			61.0	39.8			
Average percentage digested.	93.7	99.6		17.9			20.8	37.5			

Digestion Period No. 15 with Kafir Fodder.										
Sheep No. 5—										
Fed 4000 gms. No. 4546-7.	188.0	23.6	53.2	10.8	94.8	402.0	963.6	814.0	404.0	14.9
Excreted 1409 gms. No. 4548.	1.0	0	2.3	40.7	91.6	91.3	218.4	358.3	145.1	6.3
Digested.....	187.0	23.6	50.9	0	3.2	310.7	745.2	455.7	258.9	7.7
Percentage digested.....	99.4	100.0	95.7	0	3.3	77.3	77.3	55.9	64.1	55.2
Sheep No. 5—										
Total fed 4000 gms. No. 4546-7.	188.0	23.6	53.2	10.8	94.8	402.0	963.6	814.0	404.0	14.0
Excreted 1433 gms. No. 4549.	.9	.3	4.2	35.5	.....	.....	93.1	357.4	147.6	6.4
Digested.....	187.1	23.3	49.0	0	.....	.....	870.5	456.6	256.4	7.6
Percentage digested.....	99.5	98.7	92.1	0	.....	.....	90.5	56.1	63.5	54.5
Sheep No. 6—										
Fed 4000 gms. No. 4546-7.	188.0	23.6	53.2	10.8	.....	.....	963.6	814.0	404.0	14.0
Residue 308 gms. No. 4551.	.4	1.8	4.1	1.6	.....	.....	74.2	62.7	31.1	1.1
Eaten.....	187.6	21.8	49.1	9.2	.....	.....	889.4	751.3	372.9	12.9
Excreted 1567 gms. No. 4550.	1.3	.3	3.3	43.0	.....	.....	290.4	352.1	161.4	7.1
Digested.....	186.3	21.5	45.8	0	.....	.....	599.0	399.2	211.5	5.8
Percentage digested.....	99.3	98.6	3.3	.....	.....	.....	67.3	53.1	56.7	45.0
Average percentage digested.....	99.4	99.1	93.7	0	3.3	77.3	78.4	55.0	61.4	51.6
Digestion Period No. 16 with Guam Grass.										
Sheep No. 1—										
Fed 4000 gms. No. 4552-3.	100.8	22.8	45.6	17.2	232.4	318.4	909.6	1075.6	498.0	17.2
Excreted 1899 gms. No. 4554.	1.0	.2	18.7	49.4	222.0	98.0	389.9	509.5	241.6	12.5
Digested.....	99.8	22.6	26.9	0	10.4	220.4	519.7	566.1	256.4	4.7
Percentage digested.....	99.0	99.1	58.9	0	4.5	69.2	57.1	52.6	51.5	27.3
Sheep No. 3—										
Total fed 4000 gms. No. 4552-3.	100.8	22.8	45.6	17.2	.....	.....	909.6	1075.6	498.0	17.2
Excreted 1883 gms. No. 4555.	1.3	.4	12.9	59.7	.....	.....	390.8	513.0	240.2	12.5
Digested.....	99.5	22.4	32.7	0	.....	.....	518.8	562.6	257.8	4.7
Percentage digested.....	98.7	98.2	71.7	0	.....	.....	57.0	52.3	51.8	27.3
Sheep No. 5—										
Fed 4000 gms. No. 4552-3.	100.8	22.8	45.6	17.2	.....	.....	909.6	1075.6	498.0	17.2
Excreted 2015 gms. No. 4556.	1.2	.4	11.6	55.8	.....	.....	400.0	537.0	256.3	13.3
Digested.....	99.6	22.4	34.0	0	.....	.....	509.6	538.6	241.7	3.9
Percentage digested.....	98.7	98.5	68.4	0	.....	.....	56.0	50.1	48.5	22.7
Average percentage digested.....	98.8	98.5	68.4	0	4.5	69.2	63.4	51.7	50.6	25.8

TABLE 7.—NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD.

	Sugars		Starch.	Reducing sugar from hemi-cellulose.	Ren-soluble by acid.	Residue.	N. F. E. soluble.	Insoluble N. F. E.	Sugars by 1-4 per cent. sul-phuric.	Sugars by 1-4 caustic.	Insoluble precipitate from caustic.
	Mono.	Di.									
Digestion Period No. 17 with Corn Shucks.											
Sheep No. 1—											
Fed 3200 gms. No. 4557-8.....	43.8	5.4	64.3	268.8	59.2	245.1	805.4	838.9	485.8	272.0	120.0
Fed 45 gms. No. 4557-8.....	.6	.1	.9	3.8	.8	3.4	11.3	13.2	6.8	.4	1.7
Total fed.....	44.4	5.5	65.2	272.6	60.0	248.5	816.7	852.1	492.6	272.4	121.7
Excreted 1350 gms. No. 4559.....	1.2	0	4.3	103.3	101.6	119.1	345.8	447.2	160.7	8.8	96.8
Digested.....	43.2	5.5	60.9	169.3	0	129.4	470.9	404.9	331.9	263.6	24.9
Percentage digested.....	97.5	100.0	93.4	62.1	0	52.1	57.6	47.5	67.4	96.8	20.5
Sheep No. 4—											
Total fed 3200 gms. No. 4557-8.....	43.8	5.4	64.3	268.8	.....	.....	805.4	838.9	485.8	272.0	120.0
Added 12 gms. No. 4557-8.....	.2	.0	.2	1.0	.....	.....	3.0	3.5	1.8	.1	.5
Eaten.....	44.0	5.4	64.5	269.8	.....	.....	808.4	842.6	487.6	272.1	120.5
Excreted 1268 gms. No. 4560.....	.9	.1	7.2	69.0	.....	.....	280.7	347.6	150.9	8.2	90.9
Digested.....	43.1	5.3	57.3	200.8	.....	.....	527.7	494.8	336.7	263.9	29.6
Percentage digested.....	97.9	98.1	88.8	74.4	.....	.....	65.2	58.7	69.0	97.0	24.6
Sheep No. 5—											
Fed 3200 gms. No. 4557-8.....	43.8	5.4	64.3	268.8	.....	.....	805.4	838.9	485.8	272.0	120.0
Excreted 1147 gms. No. 4561.....	.9	.1	2.6	64.9	.....	.....	269.9	308.5	136.5	7.5	82.2
Digested.....	42.9	5.3	61.7	203.9	.....	.....	535.5	530.4	349.3	264.5	37.8
Percentage digested.....	97.9	98.1	95.9	75.8	.....	.....	66.4	63.2	71.9	97.2	31.5
Average percentage digested.....	97.8	98.7	92.7	70.8	.....	52.1	63.1	56.5	69.4	97.0	28.9
Digestion Period No. 18 with Honduras Rice Straw											
(baled) Sheep No. 1—											
Fed 3200 gms. No. 4663-4.....	21.8	3.8	55.0	121.3	82.6	252.8	537.0	759.0	320.0	272.2	.....
Residue 3 gms. No. 4663-4.....	.0	.0	.1	.1	.1	.2	.5	.7	.3	.0	.....
Eaten.....	21.8	3.8	54.9	121.2	82.5	252.6	536.5	758.3	319.7	27.2	.....
Excreted 1691 gms. No. 4665.....	2.0	2.5	16.6	33.8	91.6	82.0	250.6	395.0	153.0	15.2	.....
Digested.....	19.8	1.3	38.3	87.4	0	170.6	285.9	363.3	166.7	42.0	.....
Percentage digested.....	90.8	34.2	69.8	72.1	0	67.5	53.3	47.9	52.1	44.1	.....

Sheep No. 4—											
Total fed 3200 gms. No. 4663-4	21.8	3.8	55.0	121.3						320.0	27.2
Added 45 gms. No. 4668	.3	.1	.8	1.7						4.5	.4
Eaten	22.1	3.9	55.8	123.0						321.5	27.6
Excreted 1708 gms. No. 4666	3.8	0.0	15.2	35.0						154.6	15.4
Digested	18.3	3.9	40.6	88.0						169.9	12.2
Percentage digested	82.8	100.0	72.7	71.5						52.3	44.2
Sheep No. 5—											
Fed 3200 gms. No. 4663-4	21.8	3.8	55.0	121.3						320.0	27.2
Residue 777 gms. No. 4669	5.3	.9	13.4	29.4						77.7	6.6
Eaten	16.5	2.9	41.6	91.9						242.3	20.6
Excreted 1450 gms. No. 4667	1.3	1.9	19.1	27.0						131.2	13.1
Digested	15.2	1.0	22.5	64.9						111.1	7.5
Percentage digested	92.1	34.5	54.1	70.6						45.9	36.4
Average percentage digested	88.6	56.2	65.5	71.4	67.5					50.1	41.6

ACKNOWLEDGMENT.

Analyses and other work reported in this bulletin were made by Messrs. L. C. Ludlum, William Levin, J. B. Rather, J. W. Chewning, and perhaps others.

SUMMARY AND CONCLUSIONS.

1. The roughages contain only small percentages of sugars and starches, which are highly digestible.
2. Pentosans are destroyed by N/50 acid and alkali in the analytical process employed. A black powder is also formed.
3. The nitrogen-free extract of legumes is on an average more readily soluble in N/50 acid and alkali than that of non-legumes.
4. The mother substances of the reducing sugars formed from the material dissolved by N/50 acid and alkali vary decidedly in digestibility in the various tests.
5. The nitrogen-free extract soluble in N/50 acid and alkali is, as a rule, digested to a greater extent than that not soluble.
6. The black insoluble substance formed during the conversion of the material dissolved by N/50 acid and alkali into sugars is largely composed of non-nitrogenous material other than pentosans.
7. Much larger quantities of material yielding sugars are dissolved by $1\frac{1}{4}$ per cent. caustic soda.
8. Boiling with caustic soda dissolves only small quantities of material converted into sugars, but large quantities converted into an insoluble black precipitate during the process.
9. It is probable that the substances dissolved by acid and alkali contain considerable proportions of compounds other than carbohydrates.

TEXAS AGRICULTURAL EXPERIMENT STATION

BULLETIN NO. 197

NOVEMBER, 1916

PROGRESS REPORT OF SUBSTATION NO. 3, ANGLETON, TEXAS

1909-1914



POSTOFFICE:
COLLEGE STATION, BRAZOS COUNTY, TEXAS.

AUSTIN, TEXAS:
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BY

N. E. WINTERS, B. S.,
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PROGRESS REPORT OF SUBSTATION NO. 3, ANGLETON, TEXAS, 1909-1914.

BY N. E. WINTERS, B. S., SUPERINTENDENT.

INTRODUCTION.

Substation No. 3 was established in 1909, on a tract of 157 acres of land, four miles northeast of Angleton, Brazoria county, Texas, on the St. L., B. & M. Railroad. The site selected was at the time unfenced, raw prairie land, of the Victoria clay type, known locally as "hog wallow" land.

The first two years were devoted very largely to general development work, such as the erection of buildings and fences, the construction of drainage ditches, and plowing and preparing the land for experiment work. The first crops were produced in 1912, and at the beginning of the season of 1913 the land was in excellent condition for plat work.

During the seasons of 1913 and 1914 fifty acres were devoted to crops and soils work. A brief summary of the results secured are reported herein.

CLIMATOLOGICAL.

The climatic conditions for this section are exemplified in the following table, showing meteorological data for the season of 1914:

TABLE 1.—CLIMATOLOGICAL DATA, 1914.

Month.	Temp. Degrees Fahr.						Precipitation in Inches.		Number of Days.				Prevailing wind direction.
	Maximum.	Date.	Minimum.	Date.	Mean.	Greatest daily range.	Total.	Greatest in 24 hours.	With .01 inches or more rain.	Clear.	Part cloudy.	Cloudy.	
Jan.	80	9-25	27	31	55.	41	.49	.37	2	13	16	2	North
Feb.	80	6	25	7	54.	44	3.16	1.96	9	4	12	12	North
Mar.	78	25	28	8	56.5	35	2.93	1.24	6	12	6	13	South
April.	87	16	36	9	67.85	38	13.46	7.62	10	8	6	16	South
May.	93	6	56	9	75.	26	7.89	2.30	11	6	13	12	East
June.	97	29	69	2-3									
				12-26	81.	26	0.26	0.18	2	2	27	0	South
July.	98	7	68	6-27									
				28	83.	28	1.73	0.73	8	6	25	0	South
Aug.	97	3	69	8	81.	24	8.49	2.01	12	0	28	3	South
Sept.	92	11-15											
		18-28	52	25	79.	37	4.34	2.45	4	5	18	7	South
Oct.	90	10	40	28	71.	38	3.61	0.88	8	4	19	8	North
Nov.	80	8-15	32	17-20	61.	39	8.02	2.36	7	3	18	9	East
Dec.	77	1	25	14	52.	32	4.19	0.77	16	3	9	19	North

Note:—The last killing frost in the spring was March 8. First killing frost, December 26.

It will be seen from the above table that the rainfall in this section is so distributed throughout the growing season that high crop pro-

duction is favored. The maximum temperature is not so high as in the northern part of the State, while the minimum temperature ranges very little below freezing during the winter months.

The last killing frost in the spring during 1914 came on March 8. The first killing frost in the fall came on December 26, thus giving a very long growing period for crops.

EXPERIMENT DATA.

As previously stated, few results were obtained until the crop season of 1913. This report, therefore, deals very largely with results secured during the seasons of 1913 and 1914. Much of the work under way is of such a nature that several seasons will be required before reliable statements can be made. Results secured during the two years, however, represent information secured from very carefully conducted tests, and although not conclusive in every respect, they embrace much information useful to farmers of this section of the Gulf Coastal Plain.

CORN VARIETY TEST.

Thirty-six varieties of corn were grown in 1913 and fifty in 1914. The fifteen best yielders of each year are shown, together with the average for the two years, in the following table. Uniformly higher yields were obtained in 1913 than in 1914, on account of weather conditions, which favored high production.

TABLE 2.—SUMMARY TABLE OF CORN TESTS SHOWING TEN HIGHEST YIELDERS FOR THE YEARS 1913-1914.

Variety.	Source of Seed.	Shelled Corn Per Acre in Bushels.					
		1913		1914		Average for two years.	
		Yield.	Rank.	Yield.	Rank.	Yield.	Rank.
Hastings.....	Hastings Seed Co., Atlanta, Ga.	32.25	1				
Mosby's.....	Chris Reuter, New Orleans	31.82	2	20.56	8	26.19	4
Chisholm.....	A. M. Ferguson, Sherman, Texas.	30.28	3	22.16	5	26.21	3
Strawberry.....	Singleton's.....	29.30	4				
Thomas.....	Beeville Substation.....	28.89	5	25.72	2	27.30	2
Surcopper.....	A. M. Ferguson, Sherman, Texas.	28.09	6	16.71	15	22.40	7
Strawberry.....	J. L. F. Fentress, San Saba, Texas.	27.94	7	27.72	1	27.78	1
Cockes.....	T. W. Wood & Sons, Richmond, Va.	27.66	8	18.21	13	22.93	6
White Dent.....	T. W. Wood & Son, Richmond, Va.	27.55	9	21.77	6	24.66	5
Bloody Butcher.....	A. T. Miller, Thalia, Texas	26.66	10				
Mexican June.....	Lubbock Substation.....	25.99	11	18.66	12	22.32	8
Collier's Excelsior.....	T. W. Wood & Son, Richmond, Va.	24.25	12	12.24	16	18.24	11
Munson.....	A. M. Ferguson, Sherman, Texas.	23.80	13				
Laguna.....	U. S. Dept. Agriculture.....			23.47	3		
Yellow Dent.....	A. M. Ferguson, Sherman, Texas.			23.11	4		
Chappell.....	U. S. Dept. Agriculture.....			20.81	7		
Blounts.....	T. W. Wood & Son, Richmond, Va.	20.37	14	20.31	9	20.34	10
Snowflake.....	T. W. Wood & Son, Richmond, Va.	22.05	15	20.01	10	21.03	9
Yellow Dent.....	J. A. Williams, Angleton, Texas.			18.78	11		
White Dent.....	U. S. Dept. Agriculture.....			17.79	14		

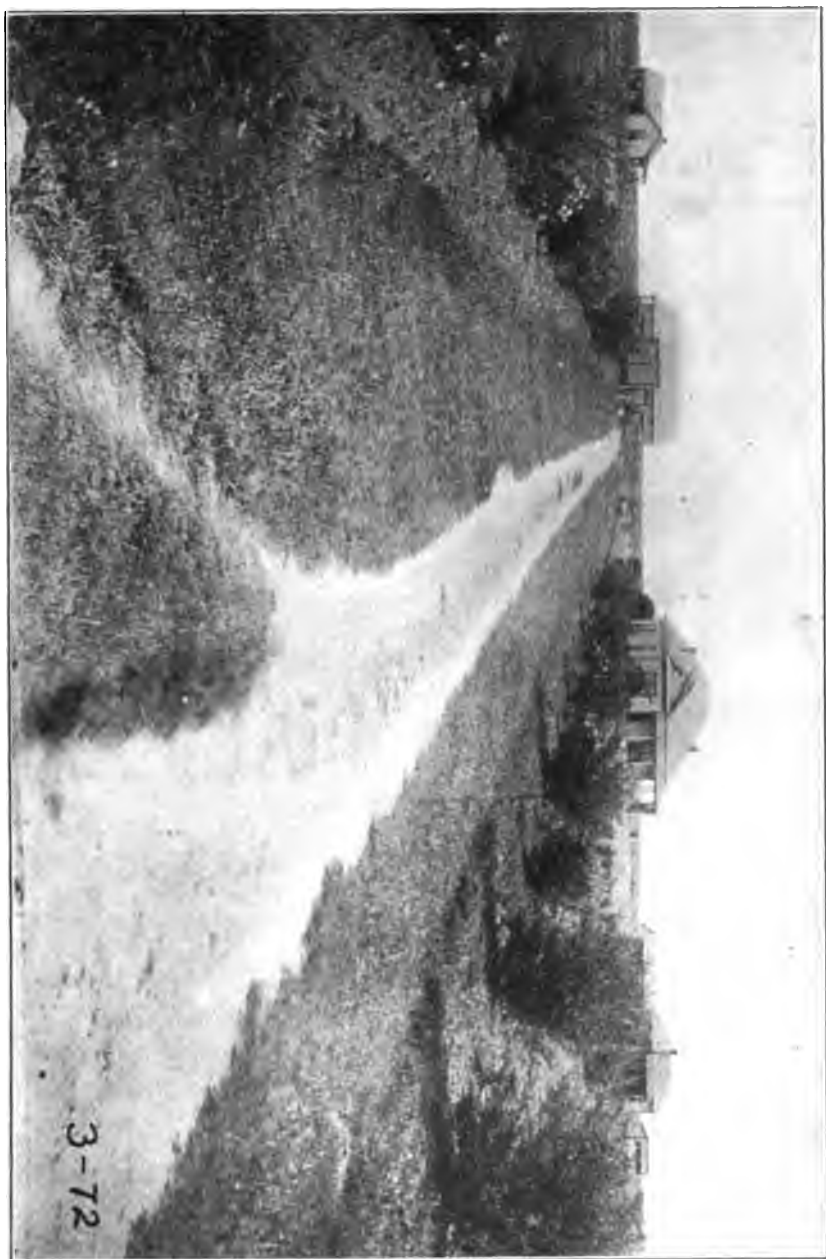


FIGURE 1. GENERAL VIEW OF THE FARM BUILDINGS FROM PUBLIC ROAD.

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It will be seen that of the fifteen best yielders each year, Strawberry, Thomas, Chisholm, Mosby and White Dent show the highest average yield for the two years in the order mentioned.

Cocke's, Surcropper, Mexican June, Snowflake, and Blount's all made more than twenty bushels per acre.

It is fair to state that some of the corn varieties which produced a good yield in one of the two years were not grown both years, owing to the impossibility of getting seed under the conditions existing at that time. Among these were Hastings, Strawberry, Bloody Butcher, Laguna, Yellow Dent, Chappell, and others.

CORN SEEDING RATE TEST.

A seeding rate test was conducted during the seasons of 1913 and 1914 to determine the rate of planting that was conducive to highest yields. A summary of the results of this work is shown in the following table:

TABLE 3.—CORN SEEDING RATE TEST, 1913-1914.

Variety Used 1913, Mexican Tuxpan. Variety Used 1914, Mexican June.

Description of Plats.				Yield Bushels Shelled Corn per Acre.		
Width Rows. Feet.	Distance Hills in Row.	Number Plants per Hill.	Hills Per Acre.	1913	1914	Average
3	6 feet	1	2420	11.52	8.13	9.83
3	3 feet	1	4840	18.38	11.65	15.02
3	2 feet	1	7260	22.50	14.21	18.36
3	18 inches	1	9680	20.71	12.71	16.71

The results from the work of these two years indicate that the heaviest yield of corn is obtained with the stalks two feet apart in the row when the rows are three feet apart. Farmers in this vicinity usually plant their corn in rows at least three and one-half feet apart, and it is likely that having the rows wider than three feet would permit the profitable planting of the hills closer together than two feet in the row.

DISTRIBUTION OF PLANTS AND ITS EFFECT ON YIELD OF CORN.

A test was conducted during the seasons of 1913 and 1914 to determine whether or not distribution of hills of corn had any effect on the yields given when the different distributions all carry the same number of stalks to the acre.

June corn was used in this test and the hills distributed as follows on different plats:

1. Rows three feet wide, stalks three feet apart in the row.
2. Rows six feet wide, stalks one and one-half feet apart in the row.
3. Two three-foot rows, alternated with two rows, fallow; stalks eighteen inches apart in the row.

A summary of the results of this test is submitted in the following table:

TABLE 4.—DISTRIBUTION OF HILLS AND ITS EFFECT ON YIELDS OF CORN.

Variety Used in 1913, Mexican Tuxpan. Variety Used in 1914, Mexican June.

Arrangement of Hills.	Yield Bushels Shelled Corn Per Acre.		
	1913	1914	Average.
Rows 3 ft. apart—Hills 3 ft. in row.....	17.74	11.97	14.86
Rows 6 ft. apart—Hills 18 inches in row.....	16.43	11.09	13.76
Two 3 ft. rows alternated with two fallow rows. Hills 18 inches in row.....	18.04	10.86	14.45

The results show practically no variation in the yields with rows of different width and stalks arranged differently in the rows so long as the stand remains the same in the different plats.



FIGURE 2—SUDAN GRASS READY TO CUT FOR HAY. 1914.

THE COWPEA AS AN INTERTILLED LEGUME CROP IN CORN AND ITS EFFECT ON YIELD OF CORN.

In this test one series of plats were left with corn alone, and in another series cowpeas were planted between the rows of corn when it was beginning to tassel. The corn on all plats was all planted on the same date and on land which had received the same kind of preparation. The cowpeas were sown in a similar manner when the proper time arrived. The same cultivation was given all plats. The cowpeas in this test failed to grow in 1914, but in 1913 a good stand was secured. The table below shows results secured during the season of 1913.

TABLE 5.—EFFECT OF AN INTERTILLED LEGUME ON THE YIELD OF CORN.

Method of Distribution of Hills.	Yield Bushels Shelled Corn Per Acre.	
	Cowpeas Planted When Corn was Beginning Tassel.	No Cowpeas Planted in the Corn.
	1913	1914
Rows 3 feet apart—Hills 3 feet in row.....	20.36	17.74
Rows 6 feet apart—Hills 18 inches.....	20.71	16.43
Two 3-foot rows alternated with two fallow rows. Hills 18 inches in row.....	19.90	18.04
Average.....	20.32	17.10

The results show, in all cases, an increased yield of corn where cowpeas were planted. The season was such that all plats had abundant moisture supply. It must be remembered that this is an increase secured in the same year the cowpeas were grown, and it should not be confused with so-called residual or succeeding years' benefits from the cowpeas.

TIME OF SEEDING LEGUMES IN CORN AND ITS EFFECT ON YIELD.

In this test all the rows of corn were planted six feet apart and the hills were eighteen inches apart in the row, giving a uniform seeding rate of 4840 hills to the acre. This work was carried both in 1913 and 1914, but in 1914 all the cowpeas failed to germinate except the first planting, due to soil and weather conditions at the time of planting. Hence, only the results secured in 1913 are given in this table.

TABLE 6.—EFFECT OF TIME OF SEEDING A LEGUME BETWEEN THE ROWS OF CORN ON THE YIELD OF CORN—1913.

Time of Planting Cowpeas.	Yield Bushels Shelled Corn Per Acre.
Corn 1 foot high.....	19.00
Corn 3 feet high.....	19.42
Corn 5 feet high.....	25.21
Corn in full tassel.....	23.07

The results obtained indicate that the yield of corn is increased as the time of planting the cowpeas is deferred, up to the time the corn is tasseling. Early planting of cowpeas in corn during the early stages of growing seems to cause a reduction of yield.

CORN ROTATION—ITS EFFECT ON YIELD.

Corn in a four-year rotation was compared to corn planted continuously on the same land. The rotation consisted of cotton, followed by cowpeas for seed, followed by corn, followed by oats, with a green manure crop of cowpeas plowed under. Strawberry corn was used in the test in 1913, and June corn in 1914. The plats included were comparable in every respect, had identically the same stand, and, other

than the rotation, received the same treatment. The results were as follows:

TABLE 7.—ROTATION VS. CONTINUOUS CROPPING OF CORN.

Year.	Yield in Bushels Shelled Corn Per Acre.		
	In Rotation.	In Continuous Cropping.	Gain in Favor of Rotation.
1913.....	27.94	25.67	2.27
1914.....	18.66	8.72	9.94

The difference in yield on rotated and non-rotated plats is very marked. This great difference seems chargeable to some of the indirect benefits of rotation, rather than the addition of plant food to the land. The organic matter put the land in excellent physical condition and no doubt increased its water-holding capacity, and caused better aeration.

OATS SEEDING-RATE TEST.

A seeding-rate test with oats was conducted, in which the crop was planted at four, six, eight, ten and twelve pecks to the acre. The Texas Red Rust Proof variety was used, and planting was made March 15, 1913. Growing conditions were such that the crop was harvested for hay. The best hay yields were secured from the seeding at ten pecks to the acre.

A second seeding-rate test was begun in the fall of 1913, which included five seeding rates, all planted November 10, 1913. The rates were two, four, six, eight and ten pecks to the acre. No seed was produced. Hay yields, however, are shown in the table below. The results here favor seeding at the rate of eight pecks to the acre:

TABLE 8.—OATS SEEDING-RATE TEST, 1914.

Seeding Rate, Pecks Per Acre.	Number of Plats.	Yield Cured Hay Per Acre, Pounds.
2.....	4	866
4.....	4	921
6.....	4	1059
8.....	4	1235
10.....	4	930

As compared to the best hay yield from ten-peck seeding-rate in 1913, it seems rather conclusive, therefore, that oats planted at eight or ten pecks to the acre in this section will afford better grazing and better hay yields than oats planted thinner or thicker.

OATS VARIETY TEST.

Seven varieties of oats were included in a variety test planted on November 15, 1913. On account of the rust, and consequent lodging, all varieties were harvested just before they reached the soft dough stage,

and cured hay weights were taken. The varieties included and their cured hay yields are shown in the following table:

TABLE 9.—OATS VARIETY TEST, 1914.

Name of Variety.	Yield of Cured Hay to the Acre. Pounds.
Rust Proof from Virginia.....	968
Appler, from Georgia.....	836
Bancroft, from Virginia.....	770
Texas Red Rust Proof, from North Texas.....	726
100-Bushel Oats, from Georgia.....	682
Frazier's Red Rust Proof, from near Dallas.....	678
Virginia Gray Winter, from Virginia.....	Failure, due to rust

The foregoing results show the best hay yields from Rust Proof oats from Virginia. The Appler, the Bancroft, and the Texas Red Rust Proof oats were also good hay yielders. The quality of the hay from the 100-Bushel Oats seemed higher than that from the other varieties. The two Texas Red Rust Proof oats included also showed excellent quality. The Gray Winter oats from Virginia failed entirely, on account of rust.

OATS—ROTATION VERSUS CONTINUOUS CROPPING.

The yield of oats grown in the four-year rotation was compared to the yield of oats grown continuously on the same land. The crop in 1913 was a failure, due to late planting and subsequent unfavorable conditions. The results secured in 1914 are shown in the following table:

TABLE 10.—OATS-ROTATION VS. CONTINUOUS CROPPING.

Year.	Rotation		Continuous Cropping.	
	Height of Growth.	Pounds Cured Hay Per Acre.	Height of Growth.	Pounds Cured Hay Per Acre.
1913.....	10 inches	failure	10 inches	failure
1914.....	30 inches	1235	20 inches	528

The results secured in 1914 were plainly in favor of crop rotation and while these results can hardly be taken as conclusive they may be taken as indicative of the benefit to be derived from the use of a good cropping system.

COWPEA VARIETY TEST.

Seven varieties of cowpeas were tested in 1913 and fourteen varieties in 1914. Tests were made both for the hay and grain yields. The two tables following show the results secured:

TABLE 11.—VARIETY TEST OF COWPEAS, YIELDS OF GRAIN—1913-1914.

Name.	Yield Bushels Shelled Peas Per Acre.					
	1913		1914		Average.	
	Yield.	Rank.	Yield.	Rank.	Yield.	Rank.
Brabham.....			29.38	1		
Blue Goose.....			24.94	2		
New Era.....	16.87	2	20.91	3	18.89	1
Red Ripper.....	7.33	6	17.62	4	12.48	4
Clay.....			17.57	5		
Chinese Red.....			15.96	6		
Whippoorwill.....	18.06	1	15.93	7	17.00	2
Groit.....	14.12	3	15.64	8	14.88	3
Large Blackeye.....			12.27	9		
Iron.....	10.45	5	12.12	10	11.29	5
Black.....			10.24	11		
The Unknown.....	12.10	4	8.77	12	10.44	6
Taylor.....			3.98	13		
Blackeye.....	4.03	7	1.51	14	2.77	7



FIGURE 3—VARIETY TEST OF COWPEAS, LOOKING ACROSS THE ROWS.

TABLE 12.—VARIETY TEST OF COWPEAS FOR CURED HAY—1913-1914.

Name.	Pounds Cured Hay Per Acre.					
	1913		1914		Average.	
	Yield.	Rank.	Yield.	Rank.	Yield.	Rank.
Clay.....			2,592	1		
The Unknown.....	1,320	6	2,323	2	1,822	4
Blue Goose.....			2,261	3		
Brabham.....			2,205	4		
Iron.....	3,102	1	2,040	5	2,571	2
Whippoorwill.....	2,035	3	1,958	6	1,997	3
Groit.....	2,664	2	1,876	7	2,270	1
Black.....			1,780	8		
New Era.....	1,650	4	1,771	9	1,711	5
Blackeye.....	1,353	5	1,595	10	1,474	6
Taylor.....			1,262	11		
Red Ripper.....	1,320	7	1,099	12	1,210	7
Chinese Red.....			816	13		
Large Blackeye.....			765	14		

In the seed production test the Whippoorwill and New Era both made excellent yields in 1913. The Brabham, Blue Goose and New Era made extraordinary yields in 1914. The average yields of varieties tested in both years show New Era, Whippoorwill, Groit, and Red Ripper to be the best seed producers, in the order named.

In the hay production test the Iron, Groit, and Whippoorwill all made good yields in 1913. The Clay, the Unknown, Blue Goose, Brabham and Iron all made good yields in 1914. The average yields of varieties tested in both years showed the Groit, Iron, Whippoorwill, and Unknown to be the best hay yielders under conditions existing during these two years.

COWPEA SEEDING-RATE TEST.

A seeding-rate test was conducted in 1913, in which Whippoorwill cowpeas were planted on April 29 at the rate of six, twelve and eighteen pounds to the acre, in rows three feet apart. All plants were grown on uniformly prepared land and received the same treatment. All were harvested for hay August 16,—109 days after planting. Harvesting was done when the first pods began to turn yellow. The cured hay yields are shown in the following table.

A similar seeding-rate test was conducted in 1914, but on account of the excessive wet weather at seeding time no results were secured.

TABLE 12.—SEEDING-RATE TEST OF COWPEAS—1913.

Seeding Rate.—Pounds Per Acre.	Pounds Cured Hay Per Acre.
6.....	2,640
12.....	3,300
18.....	3,685

It will be seen that the highest cured hay yield was secured from the thickest seeding, namely, eighteen pounds per acre. The yield of hay increased considerably with the increase in the amount of seed planted.

COWPEAS ROTATED VERSUS COWPEAS NOT ROTATED.

The yield of cowpeas on rotated land was compared with the yield on land continuously cropped to cowpeas. The rotation used was a four-year cropping system, as follows:

First year, corn.

Second year, oats, followed by cowpeas plowed under for green manure.

Third year, cotton.

Fourth year, cowpeas for seed.

The results secured are shown in the following table:

TABLE 14.—COWPEAS ROTATION VS. CONTINUOUSLY CROPPED—1913-1914.

Year.	Yield of Shelled Peas, Bushels Per Acre.		Yield Cured Hay, Pounds Per Acre.	
	Rotation.	Continuous Cropping.	Rotation.	Continuous Cropping.
1913.....	18.18	17.50	2,035	1,913
1914.....	15.93	16.20	1,958	2,100

The results show very little difference either in favor of rotation or continuous cropping. The continuous cropped plats appear to have better inoculation than the rotated plats.

SOYBEANS.

Soybeans have failed to produce successful crops on this Station both in 1913 and 1914, due to the fact that the rabbits destroyed the young plants during the early part of the season. The production of soybeans in this section may follow the extermination of rabbits.

KULTHI AND MOTH BEANS.

The Kulthi bean and the moth bean, *Phaseolus radiatus* and *Phaseolus aconitifolius*, respectively, have both been grown on this Station, but have produced no seed. The hay production has been fair and they are crops of considerable promise.

VELVET BEANS.

The velvet bean has made an enormous growth when given protection from rabbits, but all field plats planted during two seasons have been destroyed by rabbits.

SORGHUM SEEDING-RATE TEST FOR FORAGE.

A sorghum seeding-rate test was conducted during the seasons of 1913 and 1914. The Sumac variety was used in 1913 and Early Amber in 1914. Two crops were secured in 1913, but owing to late planting in 1914 only one crop was secured in that year. The seeding-rate used each year included plantings both in cultivated rows and in close drills. The seeding-rates used, the yields for each year and the average for both years are shown in the following table:

TABLE 15.—SEEDING RATE TEST OF SORGHUM FOR FORAGE—1913-1914.

Seeding Rate.	Yield Pounds.				Forage per acre.	
	1913*		1914**		Average†	
	Yield.	Rank.	Yield.	Rank.	Yield.	Rank.
Plants 1 inch in 3 foot rows.....	16,632	3	15,420	4	16,026	4
Plants 3 inches in 3 foot rows.....	12,609	6	10,760	5	12,685	5
Plants 6 inches in 3 foot rows.....	14,025	5	10,320	6	12,173	6
Plants 9 inches in 3 foot rows.....	11,990	7	10,120	7	11,055	7
Close Drills 2 pks. per acre.....	16,940	1	16,540	3	16,740	2
Close Drills 4 pks. per acre.....	16,018	4	16,840	1	16,428	3
Close Drills 8 pks. per acre.....	16,764	2	16,720	2	16,742	1

*Cured forage yields.

**Green forage yields.

†This average is taken from cured and uncured forage merely to show the ranks for the two years.

This average is taken from cured and uncured forage merely to show the ranks for the two years.

The thickest planting in cultivated rows gave the highest forage yield both in 1913 and 1914 and in the average for both years. In the close drill seedings the difference in yield for the different seeding rates was very small.

JAPANESE SUGAR CANE.

Japanese sugar cane was planted in rows six feet apart on April 11, 1914. The crop was harvested at three different dates and the green forage weight in pounds secured. The results are shown in the following table:

TABLE 16.

Date Harvested.	Height of Growth.	Yield Green Forage per Acre. Pounds.
September 10, 1914.....	6 feet	23,200
December 4, 1914.....	9 feet	51,030
December 16, 1914.....	9 feet	39,820

It will be seen from the above figures that the total green yield of Japanese cane was very large. The first cutting, on September 10, was made when the crop was immature, as Japanese cane requires time for sweetening of the stem after it reaches its maximum height. The stem of Japanese cane is somewhat tougher than the stem of sorghum, but otherwise the forage is of good quality. The last cutting, made on December 16, was damaged somewhat by the freeze of December 15, when the mercury dropped to 25 degrees Fahrenheit. A previous temperature of 28 degrees, on December 4, did not result in injury to the cane. This test indicated that the Japanese sugar cane is a very valuable crop for this section of the Gulf coast of Texas.

SUDAN GRASS.

Sudan grass for forage purposes has been planted in rows three feet apart, in rows eighteen inches apart, and in close drills at the rate of six and twelve pounds of seed per acre, respectively, both in 1913 and 1914. The crops were cut twice in 1913 and once in 1914. The table below shows the results secured:

TABLE 17.—SUDAN GRASS, METHOD OF SEEDING TEST—1913-1914.

Method of Seeding.	Seeding Rate. Lbs. per acre.	Pounds Cured Hay Per Acre for the Season.		
		1913 Cut Twice.	1914 Cut Once.	Average.
3-foot rows.....	6	6,281	2,250	4,266
18-inch rows.....	6	9,867	2,560	6,124
Close drills.....	12.	7,964	2,640	5,302

The seeding in eighteen-inch rows gave higher yields, both in 1913 and 1914, and, consequently, a higher average yield for the two years than the seeding in three-foot rows. It seems that for hay the sorghum would be preferable in this section to Sudan grass. As the latter crop suffers considerably from leaf blight, Japanese sugar cane gave a higher yield than either sorghum or Sudan grass. It seems probable, however, that Sudan grass may be of some considerable value as a summer grazing crop. It has been found that this crop is not productive of seed here on account of a small insect, known as the sorghum midge, which multiplies in great numbers under moist conditions common in this section.

DASHEENS.

Tubers of the dasheen (*Colocasia Sp.*) were obtained from the Bureau of Plant Industry, United States Department of Agriculture, in the spring of 1914. These were planted, and enough corms or tubers have been produced for more extensive work with them in the future. This plant is very promising as one to take the place of Irish potatoes for table use in this section of the State. Irish potatoes are usually a failure here on the prairie land.

TREES AND FRUITS.

Four acres have been planted to trees, vine fruits and ornamental trees and shrubs during the year of 1914. Investigational work will be done with tree and vine fruits in the future, but no results are at hand yet.

SUMMARY.

1. Substation No. 3 was established in 1909, near Angleton, Brazoria county, on Victoria clay soil, known locally as "hog wallow" land.

2. The first two years were devoted to general development work such as draining the land, erection of buildings, and the preparation of the land for experiment work.

3. The section represented by this station is supplied with abundant rainfall and a long growing season. The maximum temperature ranges lower than the temperature in the northern part of the State, while the minimum temperature ranges very little below freezing during the winter months.

4. This report deals very largely with results secured during the seasons of 1913 and 1914, and while the work done is of too short a period of duration to render conclusive information, much material is given which will be useful to the farmer of the central Gulf coast section.

5. Of a large number of corn varieties tested, Strawberry, Thomas, Chisholm, Mosby's, and White Dent showed the highest average yields, in the order mentioned, for the two years. Cocke's, Surcropper, Mexican June, Snowflake and Blount's all produced more than twenty bushels per acre. Among the corn varieties tested only one year, Hast-



FIGURE 4 GROUP OF VISITORS AT THE SUBSTATION.

ings, Strawberry, Bloody Butcher, Laguna, Yellow Dent, Chappell, and others gave good yields.

6. The seeding-rate tests of corn showed the heaviest yields from rows three feet wide and stalks two feet apart in the row, which is slightly thicker than corn is ordinarily planted in this section.

7. The results from a test including wide and narrow rows and with plants otherwise distributed differently on the land, showed little difference in the yield of shelled corn per acre in the different distributions so long as all carried the same number of stalks to the acre.

8. A series of corn plats in which cowpeas were planted were compared with a second series of corn plats in which no cowpeas were planted. The results showed a slight increase in the yield of corn where the cowpeas were planted in the corn, which indicates that under similar moisture conditions no ill effects will be had from planting cowpeas in corn.

9. A test in which cowpeas were planted in corn at different stages of maturity of the corn and compared with other plats in which no cowpeas were planted showed that the yield of corn increased as the time of planting the cowpeas was deferred up to the time of tasseling.

10. Corn grown in a four-year rotation as compared with corn grown continuously, showed an increase in yield in favor of the rotated land.

11. An oats seeding-rate test showed the largest hay yields from seedings at the rate of eight to ten pecks to the acre. No grain was produced.

12. An oats variety test showed the best hay yields from Rust Proof oats from Virginia, followed by Appler, Bancroft, and Texas Red Rust Proof. The Texas Red Rust Proof oats included showed the best quality of hay, while a gray winter oat failed entirely on account of rust.

13. Oats grown on rotated land and compared to oats grown continuously on land showed an increase in yield in favor of rotated land.

14. A cowpea variety test showed the best average yields of cowpeas for the two years from New Era, Whippoorwill, Groit, and Red Ripper. The best average hay yields were secured from Groit, Iron, Whippoorwill, and Wonderful varieties.

15. A cowpea seeding-rate test showed the highest yields of cured hay from the thickest seeding, namely, eighteen pounds to the acre.

16. Cowpeas grown on rotated land as compared to cowpeas grown on non-rotated land showed little difference either in favor of rotation or continuous cropping.

17. Soybeans failed to produce a crop, both in 1913 and 1914, due to destruction during the early growing period by rabbits.

18. Kulthi and moth beans both produced fairly good hay yields, but no seed.

19. The velvet bean under protection produced enormous growth, but field plats were destroyed by rabbits.

20. A sorghum seeding-rate test showed the highest average yields

of forage from the thickest planting when grown in cultivated rows. Little difference in yield was had from the different seeding rates when grown in close drills.

21. Japanese sugar cane produced a green yield of 51,030 pounds per acre. The last cutting withstood a temperature of 28 degrees Fahrenheit without injury, but was later severely injured by a temperature of 25 degrees Fahrenheit.

22. Sudan grass produced highest hay yields when grown in 18-inch rows. It produced no seed.. Sudan grass seems less preferable as a hay crop than sorghum in this section on account of leaf blight and other diseases. It may probably have considerable value as a summer grazing crop.

23. The dasheen has produced well in this section and promises to be a crop to supplement the Irish potato for table use.

24. Four acres of trees, vine fruits, and ornamental trees and shrubs have been planted as a basis for investigation work along these lines.

TEXAS AGRICULTURAL EXPERIMENT STATION

BULLETIN NO. 198

NOVEMBER, 1916

DIVISION OF ANIMAL HUSBANDRY

FEEDING BABY BEEVES



POSTOFFICE:

COLLEGE STATION, BRAZOS COUNTY, TEXAS.



AUSTIN, TEXAS:

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BY

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Animal Husbandry, Feeding Investigations



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*As of December 1, 1916.

**In cooperation with United States Department of Agriculture.

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PROGRESS REPORT OF SUBSTATION NO. 12, CHILLICOTHE, TEXAS, 1905-1914.

BY R. W. EDWARDS, SUPERINTENDENT.

IN COOPERATION WITH THE OFFICE OF FORAGE CROP INVESTIGATIONS,
UNITED STATES DEPARTMENT OF AGRICULTURE.

The Chillicothe substation was established in 1905 by cooperative agreement between the Texas Agricultural Experiment Station and the United States Department of Agriculture. From that time until January 1, 1916, the method of cooperation continued with very little change. The Department of Agriculture paid practically the entire field expenses, such as rent of land, purchase of machinery and other equipment, salary of man in charge and the hiring of labor. The Texas Experiment Station, on the other hand, gave the station its moral support, furnished a team and applied such funds as were received from the sale of Station products to the general expenses of the Station. Both parties shared equally in the results and received duplicate copies of reports on the experiments conducted. Mr. A. B. Conner had direct supervision over the work from 1905 to 1911, inclusive. He was succeeded by Mr. G. E. Thompson in 1912, and since March, 1913, the writer has been in charge. The Station was operated from 1905 to 1914, inclusive, on rented land. It was first located on a tract of ten acres one mile northeast of Chillicothe. In 1911 a new location of thirty acres was secured adjoining the townsite on the northwest and along the Fort Worth & Denver City Railroad. This land was used until 1915, when a tract of one hundred acres, situated five miles southwest of Chillicothe, was leased. The Texas Legislature in 1915 appropriated funds for the purchase and improvement of this latter tract of land, and the farm became known as Texas Substation No. 12.

Experiment work with forage crops at the Chillicothe (Texas) substation has been conducted cooperatively since 1905 by the Office of Forage Crop Investigations, Bureau of Plant Industry, United States Department of Agriculture and the Texas Agricultural Experiment Station. Both parties have shared equally the results of the work, and triplicate records have been kept,—one set to go for the Office of Forage Crop Investigations in Washington, D. C., one set to the Texas Experiment Station, and the third set to remain in the substation files at Chillicothe.

The incentive for experiment work with forage crops at Chillicothe was, primarily, the finding of varieties which possessed unusual drouth resistance, and the selection and improvement of these varieties. Crops belonging to the sorghum family are considered best adapted to the successful production of forage in this region and have been given first attention. A secondary consideration was the finding of some

leguminous crop which could be utilized both as a forage and for its fertilizing effects upon the soil.

During the ten years with which this report deals, no less than fifteen hundred varieties and selections of plants belonging to the sorghum family have been grown in trial plats. Naturally out of this large number a very few have been found of sufficient value to take the place of common varieties so generally grown by farmers in this section of the country. It has been the policy of the Station to test each variety or selection through several seasons before either discarding it or advocating its adoption by farmers. Some new plants, of course, show up so poorly that they may be discarded after one trial, while it is difficult to place others even after growing them several years.

In addition to the sorghums, a large number of varieties of millet, annual legumes, perennial grasses, and alfalfa have been tested. Attempts have also been made to determine by detailed experiments the best rate, date, and method of planting the crops. Approved methods of cultivation have always been employed.

This report is intended as a summary of the results secured along all lines of work for the ten years following the establishment of the Station.

DESCRIPTION.

Chillicothe, Texas, was selected as a locality in which to carry on experiment work with forage crops as the general conditions at this place are such as to make results secured there applicable to a considerable scope of country. In general, this territory may be defined as the region in Texas from Wichita Falls on the east to Clarendon on the west, south through the greater portion of West Texas and north through Western Oklahoma.

Location.

The Chillicothe substation is located near the town of Chillicothe in the eastern part of Hardeman county. It has an altitude of 1406 feet, longitude 99 degrees, and latitude 34 degrees.

Soil.

The soil on which experiments were first conducted was a fertile, chocolate colored, sandy loam varying in depth from eighteen inches to two feet and underlaid by a compact sand. This ground was easily plowed and cultivated when in proper condition. Because the soil lacked in uniformity, however, the work was moved in 1911 to a block of thirty acres on another farm adjoining the townsite. This soil was much less sandy than the first, being commonly termed very "tight" land. In addition to having a much more uniform soil than the first tract, this farm was more publicly situated, making it easily accessible to visitors.

In 1915 another change was made to a 100-acre farm five miles southwest of Chillicothe. This is a mixed sandy loam and very uni-

form in character. The present report, however, deals only with the results at the two former locations, up to and including the crop season of 1914.

Climate.

Table 1 contains a record of the annual precipitation at Chillicothe by months for the years 1906 to 1914, inclusive.

TABLE 1.

Monthly and Annual Precipitation at Chillicothe, Texas, From 1906 to 1914, Inclusive, With Monthly and Yearly Averages.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1906....	0	0	.90	3.92	1.78	4.20	8.71	2.67	5.20	4.58	T	0	31.78
1907....	0	0	3.42	.98	7.81	2.58	1.46	1.52	1.71	6.60	.80	0	26.88
1908....	T	T	.28	3.51	6.40	8.41	5.68	T	2.22	1.84	4.13	T	32.47
1909....	0	.22	1.89	1.41	.56	8.06	.49	1.07	.26	1.84	4.57	0	20.37
1910....	.64	.08	1.08	1.39	2.74	1.91	1.42	1.74	1.22	1.30	.14	.53	14.19
1911....	.10	3.89	.12	1.80	1.53	.06	3.35	3.41	3.04	.81	.60	5.07	24.18
1912....	0	1.86	3.22	1.82	.53	4.69	1.39	3.05	2.92	2.73	.08	.34	22.63
1913....	.35	1.90	1.32	1.77	1.01	2.33	.29	.05	4.21	4.71	2.79	5.51	26.24
1914....	T	.30	1.68	2.40	6.16	1.67	1.76	8.47	1.04	1.44	.41	1.28	26.59
Average.	.12	.92	1.55	2.11	3.17	3.77	2.73	2.44	2.40	2.87	1.50	1.41	25.03

From this table it will be seen that the mean annual rainfall for the nine-year period was 25.03 inches. The maximum annual rainfall during the period was 32.47 inches in 1908, and the minimum was 14.19 inches in 1910. June has the heaviest average monthly rainfall, with May, October and July coming next in order of amount.

Were the rainfall always near the normal there would be little difficulty in the production of crops so far as moisture is concerned. Both wet and dry extremes, however, are common, and it is the period of drouth which occurs at some time in nearly every year that the farmer must consider in his selection of crops and methods of planting and cultivation.

Neither the totals of monthly nor yearly precipitation can be taken as a complete index of conditions. Torrential rains are common in the spring and summer months, giving a heavy downpour for a short time, thus entailing a great deal of run-off. On the other hand, light showers of one-fourth inch or less are common. These showers all add to the total rainfall, but often are of little or no value to growing crops, since if followed by hot, sunshiny weather the moisture soon evaporates and is lost.

Temperatures of 100 degrees F. and above are common during July and August, and usually coincide with a deficiency in moisture, thus intensifying the effects of drouth.

The wind is another determining factor in crop production. High winds, especially during the spring and early summer, cause rapid evaporation from the surface soil and transpiration from the leaves of plants. In winter the occasional snowfall is frequently swept from



Figure 1. One-horse planter with press wheel used in planting row sorghums at Chillicothe substation.



Figure 2. Planter which opens a furrow and plants the seed in one operation. The per cent. of germination has been increased by attaching a press wheel to this planter.



Figure 3. Type of planter in common use by farmers in vicinity of Chillicothe.



Figure 4. Drill used in making close drilled plantings at the Chillicothe substation. A set of press wheels attached to this drill has aided germination.

the fields and the moisture it brings is largely lost to cultivated crops. The more sandy soils are often damaged and crops on them destroyed in the spring by winds which drift the surface soil, covering up or cutting off the young plants.

It is under such conditions, which are so common throughout West Texas, then, that the work at Chillicothe has been carried on.

EXPERIMENT WORK.

The experiment work with forage crops at the Chillicothe Substation has been conducted for the purpose of determining (1) the adaptability of varieties to conditions and their relative value for the farmer; (2) the introduction of new varieties or strains; (3) improvement of the most promising varieties, and (4) methods and dates of planting which will produce the highest yields.

General Methods Employed.

Plowing in preparation for spring crops has always been done as early in the fall or winter as practicable and to a depth of seven or eight inches. In some instances, due to unfavorable conditions or the lateness of removing previous crops, it has been necessary to defer plowing until late in the winter or early spring. In these cases the ground was plowed shallower than when plowed in the fall. Fall plowing is not harrowed down until spring in order that the rough surface may better catch and hold the winter rain or snow. Previously to planting, sufficient disking and harrowing is done to pulverize the surface or destroy weeds and prepare a good seedbed.

Row plantings have, for the most part, been made in shallow furrows, the land being furrowed out with a large sweep and the seed planted in the bottom of the furrow. A planter having a press wheel is used in planting. The press wheel has proved quite essential to the securing of good stands under various conditions.

Close drilled seedlings or sorghums, Sudan grass, millet and alfalfa are made with a single disk grain drill. A set of press wheels recently purchased for this drill have greatly aided in the securing of rapid and complete germination of the seed.

Cultivation of crops has been thorough, but not to the extent of being impractical. Various types of cultivators and harrows are used, depending upon the condition of the soil and the character of the work to be done.

Previously to 1913 most plantings were on plats one-tenth acre in size. Since then plantings have been made in one-twentieth acre plats and duplicated. This applies only to the more general experiments. In some instances there is neither sufficient seed nor enough land available to make all plantings on this scale. Many of the new introductions and selections are planted in smaller plats, or single rows, varying in length from one to ten rods. The most promising varieties in the small plats of one year are grown in larger plats the next season.

SORGHUM VARIETY TESTS.

Kafirs.

The kafirs in general are characterized by good yields and excellent quality of both forage and grain under favorable conditions, but do not yield as well as dwarf milo or feterita under the unfavorable conditions of a very dry season.

The forage and grain yields of blackhul kafir, dwarf milo and feterita are given in Table 2 for three contrasting seasons, 1908, 1913 and 1914, at Chillicothe. The period from April to August, inclusive, completely covers the growing season of these crops, and the rainfall during this time will give some idea of the conditions prevailing in each of the three years. From the amount of rainfall and general records kept, the season of 1908 would be considered very favorable for the production of sorghum crops except for a drouth during August. The same period in 1913, on the other hand, was very unfavorable, as there was at no time an abundance of moisture. Considering 1914 in the same way, it might well be classed as an average season.

TABLE 2.

A Comparison of the Seasonal Rainfall and the Yields of Blackhul Kafir, Dwarf Milo and Feterita at Chillicothe in 1908, 1913 and 1914.

Year.	Rainfall, Inches, April to August Inclusive.	Forage Yields in Tons per Acre.			Seed Yields in Bushels per Acre.		
		Blackhul Kafir.	Dwarf Milo.	Feterita.	Blackhul Kafir.	Dwarf Milo.	Feterita.
1908	24.00	2.99	2.58	.....	28.9	20.8	.....
1913	5.45	.95	.98	.97	0.0	9.2	10.7
1914	20.46	1.75	2.55	2.25	12.5	22.0	23.4

From this table it will be seen that kafir outyielded milo in both forage and grain in the favorable season of 1908, but that both milo and feterita produced higher yields in 1913 and 1914.

Table 3 gives the forage and grain yields of kafir and milo for the years 1907 to 1914, inclusive, with averages and seasonal rainfall. Considering the average yields of the eight years work, it will be noticed that kafir has produced more forage and less grain than milo. In addition, the kafir fodder is superior in quality to that of milo, so that both crops are valuable in their places, and farmers should continue to plant some of both each year.

TABLE 3.

Forage and Grain Yields of Kafir and Milo for the Period From 1907 to 1914, Inclusive, With Averages and Seasonal Rainfall.

Year.	Rainfall, Inches, April to August, Inclusive.	Forage Yield in Tons per Acre.		Seed Yield in Bushels per Acre.	
		Kafir.	Milo.	Kafir.	Milo.
1907	14.35	3.35	2.76	30.6	30.2
1908	24.00	2.99	2.58	28.9	20.8
1909	11.59	1.93	1.31	0.0	9.7
1910	9.20	1.98	1.12	0.0	12.8
1911	10.15	1.76	.45	0.0	0.0
1912*	11.48				
1913	5.45	.95	.98	0.0	9.2
1914	20.46	1.75	2.55	12.5	22.0
Total.....		14.71	11.75	7.20	104.7
Average.....		2.10	1.68	10.3	15.0

*No record kept of yields.

There is considerable variation among the different varieties of kafir. By using a good strain of common blackhul kafir as a basis for comparison, early blackhull (S. P. I. No. 32,707) and dwarf kafir (S. P. I. No. 24,983) have produced slightly better yields under unfavorable conditions, while red kafir (S. P. I. No. 19,492) and pink kafir (S. P. I. No. 19,742) have produced higher yields in good years. These results are explained, in part at least, by the fact that the red and pink varieties require a longer season than common blackhull, and are thus subject to greater injury from drouth. The early blackhull and dwarf varieties, on the other hand, mature earlier and so have a better chance to escape drouth. It seems to be a fact that in order to secure the qualities of earliness and sureness of producing a crop, which are commonly summed up in the term "drouth resistance," it is necessary to



Figure 5. Blackhul Kafir in alternate rows with Cowpeas.

A method of planting which furnishes good insurance against crop failure in dry seasons.

sacrifice something in yield in good seasons. In other words, the most drouth resistant varieties of kafir do not respond to abundant moisture in the same proportion that many of the common or standard varieties do.

Milos.

Dwarf milo is now commonly grown throughout West Texas and is a reliable crop in all seasons. A selection has been bred up in which tends to produce erect heads. Erectness of head in milo, however, is a character largely effected by conditions. Any condition, such as an abundance of moisture or thin stand, which tends to the production of large heads results in a larger per cent. of them being recurved or goose-necked.

Standard milo is characterized by the production of large, tall stalks, large heads, and heavy yields when planted on good soil with abundant moisture. It, however, lacks the qualities found in dwarf milo which make it a dependable producer in dry seasons. The great height to which it grows under favorable conditions is also objectionable, as it makes the crop difficult to handle.

Dwarf white milo (F. C. I. No. 5886) is a variety which has compared favorably with other grain sorghums, especially in very dry seasons. The heads are small, compact, erect or nearly so, and the seed creamy white in color. The stems are smaller and taller than those of common dwarf milo and it produces very few suckers.

Table 4 shows the yields for dwarf white milo, dwarf milo and feterita in 1913, an exceptionally dry season, and in 1914, an average season.

TABLE 4.

Forage and Grain Yields of Dwarf White Milo, Dwarf Milo and Feterita at Chillicothe in 1913 and 1914.

Crop.	Forage Yield in Tons per Acre.		Seed Yield in Bushels per Acre.	
	1913	1914	1913	1914
Dwarf white milo.....	1.10	1.98	17.5	21.3
Dwarf milo.....	.98	2.55	9.2	22.0
Feterita.....	.97	2.25	10.7	23.4

Feterita.

Feterita was first grown at the Chillicothe station in 1907, being then a new introduction from the Sudan region of Africa. For a few years it was grown only in nursery rows, although it showed considerable promise from the first. In six years from the time of its first introduction this remarkable grain and forage sorghum had spread over the country until nearly every farmer in the Southwest semi-arid region was familiar with it. At Chillicothe it has proved to be well adapted to conditions of any season, but is more especially valuable in years of severe drouth, as one of its strongest points is its ability to

produce fair crops with a small amount of rainfall. From Table IV it will be seen to compare favorably in yield with the milos.

A dwarf selection of *feterita* (F. C. I. No. 811) has consistently produced higher yields at Chillicothe than the original (S. P. I. No. 19,517), is a few days earlier, not quite as tall, and is much more uniform in height and time of ripening.

Some of the objections to *feterita* are that owing to the soft seed it frequently germinates poorly, that it shatters easily if let stand until completely ripe, and that the seed becomes discolored if exposed to the weather after it ripens. Each of these objections, however, can be largely overcome if kept in mind at planting and harvest time, by planting rather thickly, and harvesting before the seed becomes thoroughly ripe and dry.



Figure 6. Photo in 1913 showing bundles of (1) White Milo F. C. I. No. 5887, (2) Dwarf White Milo F. C. I. No. 5886, (3) Dwarf Milo S. P. I. No. 18,684 and (4) *Feterita* S. P. I. No. 19,517.

There is considerable difference of opinion among farmers as to the feeding value of *feterita*. Some value it highly, while others consider it very inferior to milo. Suffice it to say, that there are numerous instances of all classes of live stock eating, relishing and thriving upon it the same as they do on other kinds of grain sorghums.

Freed Sorgo.

Freed sorgo is a crop which has been difficult to classify. In manner of growth and appearance it resembles amber sorgo, except that the seed are white and more exserted from the glumes. The stem is quite sweet until about the time the seed ripens, when its sweetness largely disappears. The seed lacks the tannin found in sweet sorghums, thus making it more valuable for feed.

Freed sorgo is one of the earliest maturing sorghums, and when planted in May or June will mature in from eighty to ninety days. Its earliness, together with the certainty with which it produces a crop under adverse conditions, make it valuable as a catch crop or for the production of early feed. In actual yield of forage and grain it is not equal to kafir, milo or feterita.



Figure 7. Second growth of Feterita at Chillicothe in 1914. F. C. I. No. 811 (at the left), S. P. I. No. 22,329 (at the right).

Kaoliangs.

None of the kaoliang varieties seem to be of much importance at Chillicothe. The stalk is dry and pithy, having a low feeding value, and the grain yield is not equal to milo or feterita. The kaoliangs may yet come into prominence by the development of the meal or flour industry. Meal made from kaoliang grain has an excellent flavor when used for hot cakes, muffins, and so forth. A recently introduced white variety should be especially well adapted to this purpose.

Sorgos.

The sorgos are primarily forage crops, and as such they are more valuable than the grain sorghum varieties heretofore mentioned. Many farmers, however, can produce sufficient rough feed as a sort of by-product in the production of grain from grain sorghums, and do not, therefore, plant the sorgos extensively. Varieties of this type, nevertheless, hold an important place in the production of hay, bundle fodder, and silage.

Of the large number of sorgos that have been tested out at Chillicothe, only the more promising types will be mentioned herein, and

an effort will be made to sum up briefly the good and bad features of each. So far as the successful production of forage is concerned, three types of sorgos (amber, orange and sumac) about cover the field. There are, of course, a number of promising varieties in each of these classes.

The ambers are characterized by early maturity, medium height and comparatively small stem. A black glume variety known as Dakota amber is very early and especially valuable in the production of hay or early feed. It is not a heavy producer, however, and dries out badly if allowed to stand in the shock for two or more months after harvesting. Red amber is slightly later in maturing and produces a heavier yield of forage. Other varieties are black amber, Minnesota amber, Collier and McLean sorgos. Each of these has its distinct type and



Figure 8. Sumac Sorgho (at the left), Red Amber Sorgho (at the right). Photo in 1914 ninety days after planting showing Red Amber nearly ripe and Sumac not yet heading.

characteristics, but all are of similar value. All of the ambers produce a good quality of hay when sown broadcast or in close drills, and give a good yield also when conditions are such as to make this a profitable method of seeding.

Orange sorgho is intermediate between the ambers and sumac in the length of the season required for maturity. It is taller and coarser than most of the ambers and retains the juice in its stalks for a longer period after harvest. A recently selected strain of orange (C. I. No. 490) is earlier and more dwarfed than the common strains. This strain is quite promising and worthy of being planted more extensively by farmers.

Sumac or red top is the standard sorgho of the South and is well worthy of this distinction. It requires a comparatively long season for maturity, but will stand extended periods of drouth and recover when

moisture becomes available. It is a rank grower, very leafy, juicy and sweet, and has the faculty of retaining its juice and sweetness for long periods after harvest, thus insuring high palatability and feeding value. An objection to sumac is that under favorable conditions it grows so tall and rank that it is harvested and handled with difficulty. This applies to both broadcast or close-drilled seedlings intended for hay and row plantings, but is probably not an objection when it is to be used for silage, as heavy tonnage is one of the chief requisites.

Dwarf Ashburne (S. P. L. No. 21,936) is a variety resembling sumac in general appearance, but is shorter, earlier, and has larger seed. It is very leafy and sweet and might well be used to replace sumac where the tall growth and late maturity of the latter are objectionable.

Honey and gooseneck sorghos are tall, coarse varieties suitable for syrup making, but not equal to sumac, orange or amber in quality of forage.

TABLE 5.

Comparative Yields of Forage and Length of Season of the Common Sorghos at Chillicothe in 1914.

Variety.	Season Days.	Height Inches.	Forage Yield in Tons per Acre.
Freed.....	90	66	2.78
Dakota amber.....	90	62	3.43
Minnesota amber.....	93	66	4.55
Red amber.....	94	69	4.50
Collier.....	95	63	5.00
Orange.....	104	69	8.18
Sumac.....	*163	80	7.23

*Longer than usual.

With the exception of sumac, all of the varieties included in Table 5 suckered out after harvest and produced a more or less immature second growth, which is included in the column of yields. Season days and height are given for the first crop only.

RATE AND DATE OF PLANTING SORGHUMS.

Quite complete experiments have been in progress since 1907 to determine the best rates and dates of planting sorghums. Since these points are affected to a large extent by seasonal conditions, the value of the results will depend largely upon the number of years the experiment has been continued in which the average best rate or best date of planting would approach the optimum for a normal year. In rate of planting experiments it is noticeable that the sorghum plant has great ability to adapt itself to varying conditions of stand. The differences in yield due to different rates of planting, therefore, are less marked than would be true with many other kinds of crops. It is not at all uncommon to see a thin stand of sorghum send out enough tillers to make a fairly thick stand and produce finer stems and smaller heads, so that there is often more difference in the quality of the crop than in the total yield. In general, grain sorghums have produced

higher yields of both forage and grain with a stand of one plant every four to eight inches apart in the row than thinner. Sorghos have been best, considering both quality and quantity of forage, with plants from two to four inches apart in the row.

RATES IN CLOSE DRILLS.

The broadcast or close drilled method of seeding is not used extensively by the plains farmer. On the average, larger yields of forage, as well as more grain, can be produced in row plantings. The greater reliability of row plantings in withstanding drouth is a good reason for discarding the thicker method except as a catch crop under peculiarly favorable conditions.

The results of rate tests of seeding both sumac and red amber sorghos in close drills at Chillicothe, where the amounts of seed used varied



Figure 9. Cutting Sumac Sorgho in 1914 which was seed at 15 pounds per acre. The growth was too tall and coarse to be easily mowed, stacked or baled.

from 15 to 75 pounds per acre, show that red amber produced the highest yield when seeded at 45 pounds and sumac at 75 pounds per acre. In 1913, an exceptionally dry season, all close drilled seedings completely succumbed to the drouth, showing that any thick seeding rate was too thick for that year.

Since sorghum seeded in this way is usually handled like hay, the fineness of growth, as well as the total yield, is an important item. The tall, coarse stalks usually produced from thin seedings are very difficult to handle when cut with a mower. Considering both yield and quality of hay produced, the results at Chillicothe indicate that from 60 to 75 pounds of seed should be used when planted with a grain drill. In seeding broadcast, from one-third to one-half more seed will be required to secure the same stand as when seeded with a drill.

Date Plantings.

It is common knowledge that the sorghums do not germinate or develop well under the cool, damp conditions of early spring. It must be remembered that these crops are native of a subtropical climate and will reach their best development in the temperate climate only under the warmest conditions. The seed should not be planted until the soil is warm enough to insure quick germination. There is little argument in favor of very early planting except the possibility of obtaining two crops in one season. This is possible in many parts of Texas, with early maturing varieties and favorable summer and fall conditions. On the other hand, planting before the soil becomes well warmed up frequently results in poor germination, especially of the softer seeded varieties. This is usually followed by a slow early growth which allows the weeds to take advantage of the crop.

The advantages of planting late, or about July 1 at Chillicothe, are quick germination, rapid growth and heavy yields of excellent forage. On the other hand, the development of sorghums planted in July is sometimes retarded by summer drouth, so that seed will not fully mature before frost. All things considered, the middle of the possible planting season affords most satisfactory returns. At Chillicothe, May plantings have given the highest grain yields, while the forage yields have been consistently higher from plantings made on June 15 and July 1. The foregoing is a summary of three and six years results from planting feterita, milo, kafir, and sumac and freed sorgos on the first and fifteenth of each month from April to July, inclusive.

SUDAN GRASS.

Sudan grass is supposed to be native of Egypt, but may have originated farther south in Africa. The first introduction into this country was in March, 1909, when one-half pound of seed called "garawi" was received by the United States Department of Agriculture from the Director of Agriculture and Lands, of the Sudan Government, at Khartum, Egypt. A portion of this seed was planted at the Chillicothe Station that spring. The grass looked promising from the first, and its present popularity in many States is evidence of its adaptability and value in this country.

Botanically, Sudan grass is closely related to the cultivated sorghums with which it crosses readily when the two are planted close together. Its close resemblance to Johnson grass led many farmers to mistrust it at first, but it is distinctly an annual and never develops the underground rootstocks which are the chief objection to Johnson grass. It is a fine stemmed, erect, leafy plant, which stools abundantly and grows from three to five feet in height when broadcasted or close drilled. If grown in cultivated rows and allowed to mature, it frequently reaches a height of from six to ten feet. At the Chillicothe station it attains a height of from two to five feet when broadcasted or close drilled. At the Chillicothe station from two to four cuttings of hay are secured in

a season, depending upon rainfall and the time of seeding. Yields of from four to six tons of hay per acre are not unusual under favorable conditions. When planted in cultivated rows, seed yields from 400 to 800 pounds per acre may be expected in normal seasons. Occasionally two fully matured seed crops may be secured in one season.

Rate of Seeding for Hay Production.

Sudan grass seed may be sown with an ordinary grain drill. Each type of drill should be tested to determine how to set the feed to sow



Figure 10. Sudan Grass at the Chillicothe station in 1909. The first grown in this country.

the desired amount. The drill used at the Chillicothe Station, set to seed two pecks of wheat to the acre, will sow about twenty pounds of Sudan grass seed. There is considerable difference in Sudan grass seed, depending upon the completeness with which it threshed out of the hull. Table VI gives two years results with various rates of seeding at the Chillicothe Station.

TABLE 6.

Yields of Sudan Hay in Rate of Seeding Test at Chillicothe in 1913 and 1914.

Rate of Seeding in Pounds Per Acre.	Yield in Tons per Acre	
	1913	1914
10		4.31
15	1.51	5.57
20	1.26	5.01
25		5.17
30 .....	.70	
35		4.84
40 .....	.68	

In 1913 the drouth was so severe that only two cuttings of hay were secured and both of these were light. It was noticeable, however, that under these conditions the thickest seedings suffered worst and pro-



Figure 11. First cutting of Sudan Grass for hay at the Chillicothe station in 1914.

duced correspondingly less. The season of 1914 was very favorable and seeding rates produced good yields, with those of fifteen pounds per acre as the best. The variation in stand due to different rates of seeding is very marked when the grass first comes up, but gradually becomes less noticeable because of the stooling habit of the plant. The thinner seedings produce a taller, coarser growth and not as good quality of hay as is secured from seeding twenty pounds or more per acre.

Date of Seeding for Hay Production.

In this experiment it was planned to sow duplicate plats on approximately the first and fifteenth of each month from April to July, inclusive. The following table gives the number of cuttings and yields secured in 1913 and 1914.

TABLE 7.

Number of Cuttings and Total Yield of Sudan Hay Secured From Various Dates of Planting in 1913 and 1914.

Date of Seeding.	Number of Cuttings.		Total Yield of Hay in Tons per Acre.	
	1913	1914	1913	1914
April 3.....	3	3	1.19	5.75
April 15.....	2	3	.97	5.09
May 4.....	2	3	1.62	4.72
May 17.....	2	*	1.50	.....
June 3.....	1	*	.44	.....
June 15.....	1	2	.62	3.37
July 2.....	1	2	1.11	3.45
July 15.....	0	2	.00	3.18

*Unfavorable weather conditions prevented seeding on or near these dates.

This experiment has not been continued long enough to warrant the drawing of definite conclusions. It may be noticed, however, that in 1914 two cuttings were secured from plantings made as late as July 15. This was under very favorable moisture conditions of summer and fall, as seed sown on the same date in 1913 failed to germinate until September. The seedings of April 1 have been affected similarly to plantings of sorghums on this date and are characterized by poor germination, slow growth and many weeds in the first crop of hay.



Figure 12. Millet (small bale). Sudan Grass (large bale). Showing comparative yields of Millet and Sudan Grass at Chillicothe for a period of three years.

Method of Planting.

Row plantings of Sudan grass, 24 and 40 inches apart, have produced about the same yield of hay as the close drilled plats, but it is coarser and not of as good quality. Row plantings produced considerably more seed to the acre than the drilled plats. The seed crop in

rows is easily harvested with a row binder, or if not too tall, can be cut with a grain binder cutting two rows at a time.

MILLET.

Since 1908 variety tests with millet, both in plats and in nursery rows, have been made. The results of this work have served to eliminate all but a few numbers from the list of valuable varieties.

The Proso millets and those belonging to the barnyard group have proved to be of little or no value, being non-resistant to drouth and poorly adapted to conditions.

Certain numbers of pearl millet have produced heavy crops of forage in seasonable years, but they do not compete with the sorghums in yield and quality of forage.

The common or foxtail millets (*Setaria Italica*) are the only ones



Figure 13. Sudan Grass in 40-inch cultivated rows.
Photograph taken when seed was ripe.

that seem to have any promise in this section. In this group belong such varieties as Kursk, Goldmine, Hungarian, Turkestan and German.

Kursk is the earliest of these varieties, maturing in 62 days in 1914. It produces a good yield of seed, but makes such a short growth that the hay yield is always light.

Goldmine is a fine-stemmed variety with short, compact heads, and produces fair crops of both hay and seed. It is at least a week later than Kursk and grows from six to ten inches taller. It would be useful for sowing as a catch crop.

Hungarian. Several numbers of this variety have been tested. They are similar to Goldmine in length of season and height of growth, but do not yield as much hay.

Turkestan (S. P. I. No. 20,694) has consistently been a high yielder of a good quality of hay. The chief objection to this variety is its

lateness, as it requires from 107 to 120 days to mature a crop of seed. Thus it is sometimes injured more by drouth than the earlier varieties. There are two strains of S. P. I. No. 20,694, one having white seed and the other red seed. The red seeded type is later than the white seeded, but produces a better yield and quality of hay. A newer variety of Turkestan (S. P. I. No. 29,001) is earlier in maturing than No. 20,694, and looks quite promising.

German millet is also late in maturing and coarser, so that the hay is not as good quality as Turkestan.

Milletts have little place in the farming systems of the Southwest except as catch crops. Used in this way they may furnish a valuable addition to the season's hay crop. Compared with Sudan grass at Chillicothe, the best varieties of millet have produced about one-third the amount of hay for the season. They are not as drouth resistant as Sudan grass, and the hay produced is of poorer quality.

ANNUAL LEGUMES.

Work with annual legumes was started in 1905, and each year since a number of varieties of cowpeas, soybeans and other annuals have been tested in either plats or nursery row. The object of this work has been to find varieties adapted to this country and which would produce the heaviest crops of forage or the largest amount of growth for plowing under as green manure crops. In this connection, the seeding habits of the plants have been studied, as some varieties have been found which withstand drouth quite well and produce fair crops of hay, but which seldom form seed. The *Dolichos* varieties (*Dolichos biflorous* and *Dolichos lablab*) and moth bean (*Phaseolus aconitifolius*) belong to this class. The failure to produce seed is considered quite an objection to the crop since seed would have to be imported every year for planting.

The forage yields of annual legumes have as a rule been rather light, so that as a hay proposition alone they would hardly be considered profitable crops. Seed yields have also been low and at the present demand for seed and the facilities which the average farmer has for harvesting and threshing, there would be little profit from this source alone. None of the annual legumes have proved to be good money crops on the kind of soil that has been devoted to this work at the Chillicothe Station. The more sandy soils in this locality produce much better crops of cowpeas and peanuts than the Station soil, and by some system of cooperative growing and handling, these might be made profitable market crops. But until farmers realize more fully the importance of crop rotations and soil improvement by means of leguminous crops, their production will not be extensive. As a pasture crop furnishing a highly nutritious feed and for soil improvement and crop rotation purposes, the annual legumes should be given a place in the cropping system of every farm. Some farmers plant cowpeas in alternate rows with corn, and after the corn is harvested turn live stock into the field to pasture off the corn stalks and cowpeas. The advantages of this

method are: excellent pasture in the fall and soil enriched by the leguminous crop.

COWPEAS.

The best varieties of cowpeas have been better producers than any other kind of annual legume tested at the Chillicothe Station. They have consistently produced higher yields of hay and seed than soybeans, and furnish a better quality of forage.

A number of the best varieties of cowpeas, together with brief descriptive notes of each, will be given immediately following.

Early Buff.—This is one of the earliest varieties yet tested and is a fairly heavy seed producer. It has produced some peas when other varieties failed, because of drouth. The forage yield is light, due to the small growth of semi-bushy plants. The peas are light buff in color and are excellent for table use, so are suitable for garden as well as field production.

Brabham.—The Brabham embodies characteristics almost the opposite of the Early Buff, producing a heavy growth of vine. It has been consistently the heaviest hay yielding variety tested. The vine growth is mostly erect, making it easily cut with a mower. It is late in maturing compared with the Early Buff, and is a light seed producer.

The Iron cowpea is similar in habit to the Brabham, but has a rather more spreading habit and is not as heavy a hay yielder.

The Groit, New Era and Red Ripper are all excellent all-round varieties, producing good yields of both forage and seed. The New Era is, perhaps, a better drouth resister than any of the others, but under favorable conditions the Groit has produced the best yields. These varieties all grow more or less erect, depending upon the amount of growth produced. The heavy growth makes the habit more procumbent.

The Coffee variety has been one of the heaviest seed producers and also makes a good growth of vine, but is difficult to harvest because of its procumbent habit.

SOYBEANS.

Soybeans are relished more by rabbits than any other kind of legume, and experiments with this crop have frequently been ruined by the attacks of these animals. In some years the plants have been eaten off almost as soon as they came up, and were kept eaten down during the season. The crop is of questionable value in this country for the reason just stated.

In seasons when soybeans have reached maturity they have not been equal to cowpeas in either yield or quality of hay. Some of the best varieties are Chiquita, Mammoth, Cloud and Jet for forage, while the Haberlandt is a heavy seed producer. It is very dwarf and forms pods in a large cluster close to the main stem. It would be suitable to plant and pasture with hogs, allowing them to harvest the seed when ripe.

OTHER ANNUAL LEGUMES.

Many other annual legumes, including moth beans, Mung beans, hyacinth beans, tepary beans and chick peas, have been grown for one season or more. All of these are inferior to cowpeas in either forage or seed yield, or both, or in quality of hay, and are not considered worth planting in this locality in preference to cowpeas.

Experiment plantings of peanuts have been made nearly every year and forage yields, as a rule, have been quite satisfactory. Peanuts compare very favorably with cowpeas in this respect. The small Spanish and Tennessee Red varieties have proved to be the best of a large number of varieties tested.

ALFALFA.

Experiments with alfalfa have been given a prominent place in the Station work since its establishment in 1905. Seventeen varieties of alfalfa were planted June 1, 1905, in plats one rod square. This alfalfa was harvested for hay during the next three seasons, with excellent results. Table 7 shows the yields secured from these plats, calculated in pounds per acre.

TABLE 7.

Hay Yields of Variety Alfalfa Plats at Chillicothe in 1906, 1907 and 1908 Together with the Average Yield for the Three Years.

S. P. I. No.	Name.	Yield in Pounds per Acre.			Average.
		1906	1907	1908	
13440	Kansas, now irrigated.....	10080	5280	5280	6880
13521	Algeria.....	9920	7360	8320	8533
13489	Wyoming.....	9640	5760	6160	7186
13542	Provence.....	9280	4160	4960	6133
13436	Ontario.....	8160	4640	6640	6480
13547	Italy.....	8160	5120	8240	7173
13544	France.....	7680	5920	4960	6186
13545	France.....	7680	3840	3760	5093
13564	Peru.....	7680	7360	4640	6560
13439	Kansas (irrigated).....	7440	3920	6880	6080
13541	France.....	7040	4960	3680	5226
13438	Minnesota.....	7040	5760	4800	5866
13520	Germany.....	6880	5440	4000	5086
13486	Utah.....	6560	5440	4480	5493
13543	France.....	6320	4160	1920	4133
13519	Spain.....	6080	4240	5600	5306
9359	Turkestan.....	4480	1760	5600	3946
13745	Italy.....	.....	6880	4480	5680
13753	Italy.....	.....	5440	6640	6040
14972	Ecuador.....	.....	3040	6880	4960
13436	Canada.....	.....	2720	6080	4400

This table shows Kansas, Wyoming and Algeria varieties to be consistently good producers. The cuttings were made as nearly as possible when the alfalfa was one-third in bloom, and weights were taken as soon as the hay was cured sufficiently to stack. In 1906 five cuttings were secured; in 1907, three, and 1908, five.

In the fall of 1908 these plats were thinned to 18 and 30-inch rows for the purpose of getting seed yields from this method. The plats were cultivated in 1909, but owing to the poor season only two light

crops of hay, and no seed, were secured. In 1910, however, fair seed yields were obtained from these plats.

With the relocation of the station in 1911, new plantings of both row and close drilled methods were made in one-tenth acre plats, using the six most promising varieties from the previous experiment. On account of the dry season no stands were secured. Plantings were made again in September, 1911, which germinated to a stand and started off well, but were winter-killed. Plantings made in 1912 were also failures, so that the two years work was of little value.

Row and close-drilled plantings were made in the spring and again in the fall of 1913, with fair results. This being a very dry season no cuttings of any importance were secured from the spring plantings. Fall plantings made an excellent start, but suffered some winter-killing. The following table gives 1914 yields of plats, comparing row and close drilled plantings.

TABLE 8.

Method of Seeding.	Number of Crops in 1914.	Total Yield for Season in Tons per Acre.
Close drills (uncultivated).....	5	2.25
Close drills (cultivated).....	5	2.25
Rows 42 inches (cultivated).....	5	1.31

The row plantings are not considered desirable for hay production in this locality for the following reasons: (1) the yield is much lighter than from broadcast stands, except in periods of extreme drouth; (2) if the rows are not cultivated weeds fill up the space between them, and if cultivated, the loose soil and spreading growth of the plants make mowing difficult and considerable loose dirt rakes up with the hay.

In 1907 plantings were made to determine the value of inoculation of alfalfa. Solutions were used to inoculate seed for two plats, and soil for two plats, while two others received no inoculation. There was no noticeable difference in the behavior of the different plats, and nodules were found on the roots of plants in all plats. One cutting of hay was secured that season with yields slightly in favor of the seed inoculated plats. The yields were as follows:

Seed inoculated (solution) 1640 pounds per acre.

Soil inoculated (solution) 1490 pounds per acre.

Check plat (not inoculated) 1430 pounds per acre.

The acreage of alfalfa in this part of the country has increased rapidly during the last ten years. Most of the successful fields, however, are on land adjacent to rivers, creeks or draws. Under these conditions the crop is very profitable and produces from three to five cuttings each year. On upland the seasons are frequently so dry that the hay yields of alfalfa are very light. In this case it would be more profitable to utilize the alfalfa by pasturing, since a large amount of feed may be grazed off when the growth is too short to cut for hay.

MISCELLANEOUS CROPS.

Vetches.

Thirty-two varieties of vetches were planted in the spring of 1906, but very few of these reached a height of ten inches, and only three or four put out blooms. Fifty varieties were seeded again in the fall, along with oats, rye and barley. These made a good start, but all either partly or entirely winter-killed. A plat of hairy vetch sown, with oats in the fall of 1908, lived through the winter, but made very little growth in the spring.

After these trials the vetches were considered to have so little promise in this section that further plantings have not been made.

Sunflowers.

Mammoth Russian sunflowers have been planted several seasons, and in 1914 produced a good crop of large, well filled heads. This crop, however, seems to be subject to the attacks of more insects than anything else planted here. Two years the crop has been completely destroyed by insects that girdled the stems either just below the head, causing it to fall off, or just above the ground, killing the entire plant.

SUMMARY.

(1) The forage crop experiment station at Chillicothe was established in 1905, and has been operated since by the United States Department of Agriculture and the Texas Experiment Station, in co-operation.

(2) Limited funds on the part of the Texas Experiment Station made it necessary for this Station to be operated on rented land until 1914.

(3) While the Chillicothe Station has operated under many difficulties it has accomplished a great deal in the introduction and testing out of new forage crops. Feterita, Sudan grass and other new and valuable sorghums entered this State through this Station, and although funds have been very limited, the results have been worth many times the amount expended to the farmers of the State.

(4) Rainfall records for the ten-year period included in this report show the mean annual rainfall to be 25.03 inches. May, June, July and October ordinarily have the heaviest rainfall. The precipitation during any one year is likely to vary widely from the normal.

(5) The work conducted thus far has been toward determining:

(a) The adaptability of varieties to conditions and their relative values for the farmers.

(b) The introduction of new varieties or strains.

(c) The improvement of the most promising varieties.

(d) Methods and dates of planting productive of highest yields.

(6) Experiments in which different varieties of grain sorghums have been compared show that the kafirs outyield the milos in both forage

and grain in favorable seasons, but that in seasons of poor growing conditions milo and feterita are both more productive than kafir. An eight-year average shows kafir to have produced higher forage yields than milo, but a lower average yield of grain. It seems to be a fact that in order to secure the qualities which are ordinarily termed "drouth resistance," it is necessary to sacrifice something in yield in good seasons. In other words, the most drouth-resistant varieties of kafir do not respond to abundant moisture in the same proportion that many of the common or standard varieties do.

(7) A dwarf selection of feterita, F. C. I. No. 811, has consistently produced higher yields at Chillicothe than the original strain, S. P. I. No. 19,517. It is earlier, more dwarf and more uniform in height at time of ripening. The kaoliang varieties seem to be of little importance to this section, as the stalk is dry and pithy and the grain yield not equal to milo, feterita or kafir. Meal made from kaoliang grain has an excellent flavor when used for pancakes, muffins, and so forth. and the crop may come to have some special value as human food.

(8) The amber sorghums produce a good quality of hay when sown broadcast or close drills, and being early maturing varieties, produce well under limited moisture conditions. The sumac or red top sorgo, under favorable growing conditions, produces much larger yields than the ambers, but unless planted thickly the stems may be somewhat too coarse for hay. The honey and the gooseneck sorgos are tall-growing varieties suitable for syrup making and for ensilage. The quality of hay, however, is somewhat inferior to that of amber and sumac.

(9) Rate and date plantings of sorghums have shown, in general, that the grain sorghums produce highest yields of both forage and grain with a stand of one plant every four to eight inches in the row. Sorgos have produced best yields, considering both quality and quantity of forage, with plants from two to four inches apart in the row. It should be borne in mind, however, that the rate of seeding that will give the highest average yield for a period may frequently be too thick to give the maximum yield in a given year, and that, therefore, planters should be cautious in approaching the seeding rates which will give the highest average yield.

(10) Sumac and red amber planted in close drills have shown best hay yields when seeded at 75 and 45 pounds to the acre, respectively.

(11) Since sorghum is a subtropical crop, very early plantings are not recommended. Plantings made from April 15 to May 15 have given highest grain yields. The highest forage yields have been had from plantings made from June 15 to July 1.

(12) Sudan grass has produced best hay yields when planted at 15 pounds of seed to the acre in close drills.

(13) A date of seeding test with Sudan grass, although conducted for a limited time, indicates that very early planting is not productive of high yields. Medium early plantings have given the largest number of cuttings and the largest yields of cured hay. Sudan grass has been found to produce considerably more seed in cultivated rows than in

drilled plats. Hay yields have been about the same in close drills and in cultivated rows with a better quality of hay produced in close drills.

Several millets have been grown. While all seem inferior to Sudan grass for hay purposes, the Turkestan has been found a very high yielder and a producer of a good quality of hay. The pearl millet, Kursk, Goldmine, Hungarian and others are much inferior to Turkestan for forage purposes.

Of the annual legumes suitable for crop rotation, the cowpea is one of the best. The Early Buff, the Brabham, Iron, Groit, New Era and Red Ripper are all excellent varieties. The New Era and the Early Buff are perhaps the best seed producers under limited moisture conditions. Under more favorable conditions the Groit has been found a good yielder of both forage and seed. A number of soybeans have been tested, but little results have been secured owing to depredation of rabbits. Some of the best varieties grown to maturity have been the Chiquita, Mammoth, Cloud and Jet for forage purposes, while the Haberlandt has been found a heavy seed producer.

A test of a number of varieties of alfalfa have shown Kansas, Wyoming and Algeria alfalfas good producers. Close drill seedings have shown better hay yields than seedings in rows 42 inches apart.

Inoculation tests conducted in 1907 showed only a slight difference in yield in favor of inoculation. However, nodules were found on all plants whether inoculated or not. Artificial inoculation is not recommended here, as undoubtedly the benefits had are very slight and will be apparent only the first season.

Some fifty varieties of vetches have been tested and none have been found suited to this section.

Sunflowers have been planted with a view to determining the value of the crop for conditions here. Results have shown this crop subject to the attack of more insects than any other crop planted on the farm. It is not considered profitable here.

TEXAS AGRICULTURAL EXPERIMENT STATION

BULLETIN NO. 203

DECEMBER, 1916

DIVISION OF CHEMISTRY

The Productive Values of Some Texas Feeding Stuffs



B. YOUNGBLOOD, DIRECTOR,
COLLEGE STATION, BRAZOS COUNTY, TEXAS.

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*As of December 1, 1916.

**In cooperation with United States Department of Agriculture.

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THE PRODUCTIVE VALUES OF SOME TEXAS FEEDING STUFFS.

BY

G. S. FRAPS, Ph. D., CHEMIST IN CHARGE; STATE CHEMIST.

The value of a feeding stuff for feeding purposes depends upon several things. These include its bulk, its palatability, its ash content, its suitability to the animal, its vitamine content, its digestible protein and its productive value. The most important of these from the point of animal nutrition are the digestible protein and the productive value.

DEFINITION OF TERMS.

Digestible Protein.—Protein is the constituent of the feed which is used to form lean meat, muscle, skin, hair, and similar portions of the body, secretions of the body which are necessary for life, and to replace and repair animal tissue. The protein is equal to nitrogen multiplied by 6.25.

The digestible protein is that which is digested and absorbed during the passage of the food through the animal body. The digestible protein represents the capacity of the food to furnish material for the production of lean meat, or for the repair or replacement of the tissues of the animal body.

It is made up of a variety of constituents and varies in character in the different feeding stuffs. In the same feeding stuff, there are usually several different kinds of chemical compounds in the protein. The proteins of some feeding stuffs appear to lack part of the essential constituents for the proper replacement or the repair of the animal tissues, and for this reason are not as effective as they should be. The investigations along this line are not yet sufficiently definite to permit satisfactory statements with regard to the qualities of different protein constituents in feeding stuffs.

Productive Value.—Productive value means the value of the feeding stuff to furnish the material for heat, for work, or for the production of fat. Protein, when digested, may be burned for the production of heat, or energy, or its nitrogen may be split off and the residue used for the formation of fat. Fats, when digested, may likewise be used for heat or energy, or may be stored up for fat. The same is true of the constituents of the nitrogen-free extract and of that portion of the crude fiber which is digested.

The work of digestion consumes a certain amount of energy which must be furnished from that of the feed digested. Energy is also used for metabolic changes consequent on the digestion of the food. The energy left after these uses are provided for may be used for productive purposes, and this is what we term the productive value of a feeding

stuff. It is the value of a feed for the purpose of producing fat, after all of the requirements consequent on the consumption of the food have been deducted. The fat may be burned for heat or used for work, or for material production of fat or milk.

Feeding stuffs vary considerably in the amount of loss in the processes consequent upon digestion. For example, the digested constituents of high grade cotton seed meal have a full value for the production of fat, but the digested constituents of wheat straw have only one-fifth the value, pound for pound, of those of cotton seed meal. Feeding stuffs rich in crude fiber suffer a great loss in digestion, and the productive value is consequently lowered.

The productive value is calculated from the results of tests with various feeds, in which the animal is first fed a measured ration sufficient to form a little fat and the quantity of fat determined. Then the animal is fed the same ration with the addition of the feed to be studied, and the quantity of fat again measured. The additional quantity of fat produced is due to the addition of the feed to be studied and represents its fat producing power.

Ash of feeding stuffs is particularly important in growing animals, as it is necessary for the formation of bone, and certain portions of it are also required for the blood.

Vitamines are substances which are believed essential in the life of the animal, some of which appear to be absent from highly-milled materials or from their by-products. For example, they are not present in polished rice. They are, however, present in seeds and in meat, and in the leaves of plants. It is believed there are two different groups, and that one group is present in the seeds and another present in the leaves. The relation of this matter to animal feeding requires further investigation. At present the matter appears of significance chiefly in connection with pigs, although possibly in connection with breeding animals.

DIGESTION EXPERIMENTS.

The productive values and the values for the digestible protein in this bulletin have been calculated from the results with digestion experiments on sheep. The method of conducting the experiments is the same as that described in Bulletins 147 and 166 of this Station. The production coefficients were calculated as described in our Bulletin 185. Details of the experiments are given in tables in the back of this bulletin or in connection with the feeds described.

DESCRIPTION OF THE FEEDS AND DISCUSSION OF RESULTS.

The composition of the feeds used and their average composition are shown in Table 1, together with the digestible protein and the productive value of the feed. The coefficients of digestibility are given in Table 2. Table 3 contains the production coefficients of the various feedings stuffs. A discussion of the individual feeding stuffs is given below.

TABLE 1. COMPOSITION AND FEEDING VALUE OF FEEDS USED IN THE EXPERIMENTS.

Lab No.	Protein.	Ether extract.	Crude fibre.	Nitro-free extract.	Water.	Ash.	Reference No.	Pounds digestible protein.	Productive value.
11438-9	4.07	1.36	31.81	43.86	7.38	11.52		4	5.3
8227-8	14.76	1.93	28.42	37.35	9.12	8.39	1	11.0	8.7
8316-7	12.02	1.41	31.85	39.17	8.06	7.49		6.8	7.20
9537-8	10.19	1.46	37.57	34.09	8.89	7.81		8.8	7.7
	12.32	1.46	36.90	35.18	12.82	7.75	1	8.8	19.8
	9.23	3.85	2.92	70.97	10.09	1.37		8.9	22.4
8406-7	10.36	4.73	1.96	71.41	10.09	1.46		8.9	7.3
	7.17	4.73	24.90	49.39	8.57	7.92	1	2.8	7.9
	6.00	1.63	26.90	49.62	7.73	8.12		1.1	3.8
	2.1	0.8	6.3	15.4	73.7	1.7	4	1.2	
	2.01	33.47	7.42	13.61	74.65	1.85			
8168-9	38.26	31.61	2.12	15.09	7.13	4.40	2		
9688-9	40.92	0.69	2.36	15.73	4.93	4.48	2		
	4.08	0.69	49.20	32.93	10.26	2.84			
9726-7	4.08	0.54	51.87	32.79	7.71	3.02			
	23.71	17.09	25.48	33.69	6.23	3.80			
8108-9	14.82	1.56	33.62	33.61	9.85	6.75	5		18.1
8318-9	12.69	2.75	2.42	69.18	11.13	1.84		10.7	8.5
11127-8	13.83	2.93	2.15	69.92	9.51	1.68		11.4	20.7
	5.16	1.68	29.21	41.89	13.71	1.35		12.5	8.2
	24.94	3.27	8.08	50.36	10.56	2.79	5	22.4	24.6
8742-3	27.18	2.87	21.56	50.13	13.39	4.32		24.2	19.6
9949-50	9.28	1.33	25.63	45.75	12.54	3.17	1	7.6	16.2
	10.03	2.67	25.63	45.75	12.54	8.53		0.9	5.4
	7.23	1.03	25.63	45.75	12.54	9.80		4.8	18.6
	5.22	1.59	25.92	45.43	12.86	7.91	3	7.3	18.4
	9.76	2.54	7.34	68.38	10.39	3.01		6.2	15.9
	8.62	2.54	7.34	68.38	9.17	3.43		7.2	
	8.34	2.73	6.37	69.72	9.60	3.96		0	6.8
	3.32	2.73	7.37	67.07	10.69	10.22			
	2.34	2.58	33.93	44.68	16.41	10.22			
	2.34	1.33	33.93	44.68	16.41	10.22			
	2.25	1.33	16.79	59.19	18.40	10.22			
	19.74	1.33	25.37	13.63	13.63	10.22		2.4	13.6
	19.17	34.40	25.37	13.63	5.03	10.22		15.1	23.9
	22.72	35.16	18.17	13.63	5.03	10.22		18.8	22.4
	5.12	3.29	63.47	16.13	9.44	3.91	5		
	6.16	3.29	55.60	19.12	9.44	3.91	5		
	8.85	3.69	48.80	22.53	8.66	6.47		6.1	1.5

TABLE 1. COMPOSITION AND FEEDING VALUE OF FEEDS USED IN THE EXPERIMENTS—Continued.

Lab. No.	Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.	Reference No.	Pounds Digestible protein.	Productive value.
11233-6	Peanut hulls, D. E. 77	6.34	58.53	14.49	7.18	11.94		7.9	14.4
	Peanut hay, with nuts (calculated), D. E. 40	11.05	21.66	37.60	10.71	7.02		12.1	15.3
	Peanut hay, with nuts (calculated), D. E. 77	15.64	17.83	29.18	7.20	6.98		10.0	15.6
	Peanut hay, with nuts, average (4)	13.22	23.75	34.95	9.61	6.77	5	6.3	10.7
	Peanut hay, nuts removed, average (13)	9.90	23.75	44.61	8.85	8.81		4.9	11.7
7975-6	Peanut hay, nuts removed, average (13)	7.72	22.71	49.51	11.87	8.72			
7964-5	Peanut hay (no nuts), D. E. 41	7.59	21.62	47.86	7.10	11.36			
9814-5	Peanut hay (no nuts), D. E. 40	10.11	23.33	44.44	8.38	7.24			
11212-3	Peanut hay (no nuts), D. E. 69	9.43	27.87	44.05	8.67	8.72		6.7	10.8
11232-5	Peanut hay (no nuts), D. E. 76	9.70	27.39	42.21	8.67	8.72		6.0	10.3
11234-7	Peanut hay (no nuts), D. E. 77	28.45	27.39	42.21	8.67	8.72			
9748-9	Peanut kernels, D. E. 77	17.12	46.83	13.35	10.09	2.44			
	Peat, D. E. 67	0.83	10.01	34.90	10.09	27.05		0.5	0.4
7724-5	Prairie hay, Texas, average (10)	4.38	28.97	48.79	8.16	7.57	5	0.5	7.1
9337-8	Prairie hay, S. W. Texas, D. E. 38	4.30	30.56	47.30	7.61	7.80		0	5.2
11504-3	Prairie hay, D. E. 61	4.99	32.21	45.19	8.66	6.98		1.3	9.3
	Rhodes grass hay, D. E. 82	5.44	32.12	43.07	7.20	10.49	6	2.4	8.2
8245-6	Rough rice, ground, average	8.09	8.89	64.52	11.68	5.02		6.1	15.9
8251-2	Ground rough rice, dry stock burnt, No. 1, No. 49	8.68	8.49	67.21	9.99	4.07		5.6	16.0
8269-70	Ground rough rice (X), musty and damaged, No. 50	8.13	8.32	67.08	11.62	3.86		6.1	16.0
11259-60	Ground rough rice, sound, No. 4, No. 51	8.10	8.32	67.89	10.00	4.19		5.6	16.4
11138-9	Rice hay, D. E. 78	5.66	30.99	39.91	6.95	15.12		2.2	5.4
8223-4	Rice hay, D. E. 75	2.79	35.44	45.57	6.98	7.87		0.5	6.7
	Shallu stover, D. E. 75	1.97	6.86	19.77	68.42	2.13		0	4.0
	Sorghum silage, No. 47	1.60	6.16	12.40	77.29	1.31	1	0	2.6
7991-2	Sorghum silage, average (7)	5.38	28.52	48.77	8.86	5.67	1	3.2	9.9
	Sorghum fodder, average (6)	6.02	27.42	46.32	10.49	7.20	5	2.3	8.4
7763-4	Sorghum hay, No. 43	8.75	30.41	41.54	8.61	8.96		4.3	7.4
7980-1	Sudan hay, average (9)	4.42	1.47	30.63	10.43	5.17		0.8	7.8
9290-1	Sudan straw, No. 42	7.80	30.68	42.85	9.57	7.63		3.6	6.1
9408-8	Sudan hay, No. 60	10.75	30.99	38.23	9.44	8.87		6.2	8.1
10877-8	Sudan hay, No. 62	11.30	27.94	40.59	8.69	9.31		7.2	8.6
	Sudan hay, D. E. 73	17.82	30.14	43.05	8.92	8.18		4.5	21.9
9629-30	Wheat shorts, D. E. 64	18.01	3.10	69.53	8.87	0.97	3	14.7	18.9
	Wheat shorts, Texas, average	17.22	4.39	61.05	9.58	3.52		15.2	

Acuff Sorghum Fodder Used in Experiment 81.

This was grown at Substation No. 8, Lubbock, Texas. The stalks averaged $\frac{1}{2}$ to $\frac{3}{8}$ of an inch in diameter at the butt end. There were no heads. This is a grain sorghum type.

The experiment shows that it has almost the same feeding value as kafir fodder (D. E. 79) and less than milo fodder.

Alfalfa Hay.

Alfalfa used in Digestion Experiment 48; sample No. 8227-8: This hay was purchased in Bryan, Texas. It was of fair quality, but contained some dead stems.

TABLE 2. COEFFICIENT OF DIGESTIBILITY OF FEEDS.

Laborat		Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Ash.	Reference No.
11438-9	Acuff sorgo forage, D. E. 81.	9.1	37.1	58.2	45.6	1.4	
	Alfalfa hay, average.	75.3	38.4	46.2	68.8	49.9	1
8227-8	Alfalfa hay, D. E. 48, 53 (48).	67.7	14.5	41.9	72.2	52.5	
	D. E. 53.	66.3	20.7	32.5	67.2	37.6	
8316-7	Alfalfa hay, D. E. 54, 58 (54).	66.3	43.7	49.4	65.2	49.6	
	D. E. 58.	67.9	39.8	51.1	66.6	49.2	
9537-8	Alfalfa hay, D. E. 63.	70.7	27.7	53.2	70.8	55.1	
	D. E. 68.	67.7	15.2	53.5	69.5	52.8	
	Corn chops, average.	67.0	90.0	92.0	92.0		1
8406-7	Argentine corn, chopped, D. E. 56.	86.3	91.3	94.2	97.9	99.4	
	Bermuda hay, average.	52.0	42.0	52.0	51.0		4
10981-2	Bermuda hay, D. E. 72.	47.5	55.8	53.9	57.0	28.7	
	Corn silage, dent mature, average.	51.0	82.0	65.0	71.0		4
8168-9	Corn silage, D. E. 46.	59.2	69.4	74.7	76.3	43.8	
9726-7	Cottonseed, D. E. 65.	79.5	96.3	52.5	68.1	58.4	
8108-9	Dolichos lablab hay, D. E. 45.	72.3	52.0	54.7	64.6	28.5	
8318-9	Feterita seed, D. E. 55.	90.0	74.5	50.0	96.6	89.0	
11127-8	Feterita fodder, D. E. 74.	50.1	58.7	66.3	60.9	29.2	
8742-3	Jack bean, chopped, D. E. 59.	89.6	81.6	80.2	96.8	89.6	
11299-300	Kafir forage, D. E. 79.	18.2	47.6	48.6	46.3	0	
	Kafir fodder, average.	46.0	60.0	60.0	67.0		4
9949-50	Kafir fodder, immature heads and stalk, D. E. 70.	62.4	56.4	68.8	69.8	37.2	
	Kafir heads, average.	63.0	74.0	61.0	80.0		4
	Milo head chops, average.	75.6	86.7	51.7	90.8	30.9	
8590-1	Milo head chops, white and yellow, D. E. 57.	79.4	88.6	84.4	93.1	61.7	
9733-4	Milo head chops, D. E. 66.	71.8	84.8	18.9	88.5	37.8	
11352-3	Milo forage, D. E. 80.	0	56.6	65.8	49.2	0	
	Milo fodder.	16.0	63.0	51.0	61.0		4
	Milo stalk with heads, D. E. 71.	38.1	70.9	72.0	78.2	51.6	
8002-3	Moth bean hay, D. E. 44.	67.1	10.8	52.3	64.9	6.3	
8275-6	Peanut hulls, D. E. 52.	62.2	95.9	16.4	57.6	6.8	
	Penut hay, no nuts, average.	64.0	63.8	49.6	75.5	29.6	
	Peanut hay, with nuts, average.	75.8	92.0	47.9	68.3	37.1	
7975-6	Peanut hay, no nuts, D. E. 41.	63.5	48.9	53.0	80.2	67.7	
7964-5	Peanut hay, with nuts, D. E. 40.	71.5	90.8	46.0	73.5	77.6	
9814-5	Peanut hay, few nuts, D. E. 69.	65.7	71.3	45.6	76.8	0	
11212-3	Peanut hay, no nuts, D. E. 76.	63.6	69.0	48.5	75.5	30.2	
11232-5	Peanut hay and peanuts, D. E. 77.	77.3	95.3	45.3	57.1	12.3	
	Peanuts, whole, D. E. 40.	78.8	97.6	29.9	18.8	0	
	Peanuts, whole, D. E. 77.	82.8	89.0	39.0	6.7	0	
	Peanuts, whole, average.	80.8	93.3	34.4	12.8	0	
9748-9	Peat, D. E. 67.	0	100.0	0	0	1.6	
	Prairie hay, Texas, average.	10.8	42.0	58.4	51.8	9.4	
7724-5	Prairie hay, S. W. Texas, D. E. 38.	0	34.8	59.9	53.9		
9337-8	Prairie hay, D. E. 61.	25.4	36.9	53.4	49.3	4.5	
11504-5	Rhodes grass hay, D. E. 82.	43.8	45.3	67.9	58.0	27.9	
	Rough rice, ground, average.	75.6	76.1	10.4	90.6	7.7	
8245-6	Rough rice, ground, dry stack burnt, No. 1, D. E. 49.	82.3	85.0	18.1	90.9	0	

TABLE 2. COEFFICIENT OF DIGESTIBILITY OF FEEDS—Continued.

Laboratory No.		Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Ash.	Reference No.
8251-2	Rough rice ground (X) musty, D. E. 50	69.5	69.5	13.2	90.2	11.8	.....
8269-70	Rough rice ground, sound No. 4, D. E. 51.	75.0	73.9	0	90.8	11.3	.....
11259-60	Rice hay, D. E. 78	37.8	56.0	51.3	47.6	.....	.....
11138-9	Shallu forage, D. E. 75	0	32.3	64.7	50.4	49.2	.....
8223-4	Sorghum silage, average	0	56.0	58.0	64.0	4.0	.....
	Sorghum silage, No. 47	23.0	62.6	56.4	66.9	16.3	.....
	Sorghum fodder, average	38.0	65.0	61.0	63.0	4.0	.....
7991-2	Sorghum hay, No. 43	38.2	62.0	62.2	63.0	28.4	.....
	Sudan hay, average	49.4	54.0	61.2	52.9	24.8	.....
7763-4	Sudan hay, No. 39	17.7	48.7	63.1	57.6	30.0	.....
7980-1	Sudan stover (seed removed) No. 42	45.9	34.5	60.0	47.7	6.8	.....
9290-1	Sudan hay, No. 60	58.3	45.2	58.6	41.8	23.5	.....
9408-9	Sudan hay, best quality, No. 62	64.2	61.1	60.2	52.6	15.0	.....
10987-8	Sudan hay, some crab grass, D. E. 73	57.3	61.1	62.8	59.6	32.2	.....
	Wheat shorts, white average	88.0	86.0	36.0	88.0	.....	4
19629-30	Wheat shorts D. E. 64	92.1	86.7	50.0	98.5	35.5	.....

Alfalfa Hay used in Digestion Experiment 54: This hay was purchased in Bryan, Texas. It was coarse and of inferior quality, containing some hay from overripe alfalfa.

Alfalfa Hay used in Digestion Experiments 63 and 68: Purchased in Bryan, Texas. This hay was of poor quality and had formed seeds before it had been cut. The stalks were large and many of them were brown and held few leaves.

These three samples of alfalfa hay were of lower quality than the average, and also had lower feeding values. They evidently consisted largely of stems.

TABLE 3. PRODUCTION COEFFICIENTS.

Lab. No.		Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.
11438-9	Acuff sorgo forage, D. E. 81	.021	.175	0	.114
	Alfalfa hay, average	.177	.202	— .025	.172
8227-8	Alfalfa hay, D. E. 48, 53	.157	.093	— .050	.174
8316-7	Alfalfa hay, D. E. 54, 58	.158	.220	— .014	.165
9537-8	Alfalfa hay, D. E. 63, 68	.163	.113	— .017	.175
	Corn Chops, average	.157	.538	0	.230
8406-7	Argentine corn, chopped, D. E. 56	.203	.546	.090	.245
	Bermuda hay average	.122	.220	— .010	.128
10981-2	Bermuda hay D. E. 72	.115	.294	— .015	.143
	Corn silage, dent mature, average	.120	.389	.078	.178
8168-9	Corn silage, D. E. 46	.139	.367	.102	.191
9726-7	Cottonseed, D. E. 65	.187	.576	— .010	.170
8108-9	Dolichos lablab hay, D. E. 45	.170	.273	0	.162
8318-9	Feterita seed, ground, D. E. 55	.212	.446	0	.242
11127-8	Feterita fodder, D. E. 74	.118	.278	.026	.152
8742-3	Jack bean, chopped, D. E. 59	.211	.488	.060	.242
11299-300	Kafir forage, D. E. 79	.043	.226	— .020	.116
	Kafir fodder, average	.108	.284	.010	.168
9949-50	Kafir fodder (immature heads and stalk) D. E. 70	.147	.337	.032	.175
	Kafir heads, average	.148	.443	.013	.200
	Milo head chops, average	.177	.518	— .011	.227
8590-1	Milo head chops, white and yellow, D. E. 57	.187	.530	.070	.233
9733-4	Milo head chops, D. E. 66	.169	.507	— .090	.221
11352-3	Milo forage, D. E. 80	0	.268	.025	.123
	Milo fodder	.038	.299	— .013	.153
	Milo stalk with heads, D. E. 71	.090	.424	.040	.195

TABLE 3. PRODUCTION COEFFICIENTS—Continued.

Lab. No.		Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.
8002-3	Moth bean hay, D. E. 44.....	.158	.057	.010	.162
8275-6	Peanut hulls, D. E. 52.....	.146	.454	— .100	.144
	Peanut hay, no nuts, average.....	.150	.336	— .016	.189
	Peanut hay, with nuts, average.....	.178	.484	— .020	.171
7975-6	Peanut hay, no nuts, D. E. 41.....	.149	.257	.00	.200
7964-5	Peanut hay, with nuts, D. E. 40.....	.168	.543	— .025	.184
9814-5	Peanut hay, few nuts, D. E. 69.....	.154	.375	— .026	.192
11212-3	Peanut hay, no nuts, D. E. 76.....	.149	.363	— .020	.189
11232-5	Peanut hay and peanuts, D. E. 77.....	.181	.501	— .026	.143
	Peanuts, whole, D. E. 40.....	.185	.584	— .070	.047
	Peanuts, whole, D. E. 77.....	.194	.532	— .050	.017
	Peanuts, whole, average.....	.190	.557	— .060	.032
9748-9	Peat, D. E. 67.....	0	.474	0	0
	Prairie hay, Texas, average.....	.025	.221	.006	.130
7724-5	Prairie hay, S. W. Texas, D. E. 38.....	0	.183	.010	.135
9337-8	Prairie hay, D. E. 61.....	.060	.194	.010	.123
11504-5	Rhodes grass hay, D. E. 82.....	.103	.238	.030	.145
	Rough rice ground, average.....	.178	.456	— .114	.227
8245-6	Rough rice, ground dry stack burnt, No. 1, D. E. 49.....	.193	.509	— .095	.227
8251-2	Rough rice ground, musty (X) D. E. 50.....	.163	.416	— .110	.226
8269-70	Rough rice ground, sound, No. 4, D. E. 51.....	.176	.442	— .140	.227
11259-60	Rice hay, D. E. 78.....	.090	.295	— .010	.119
11138-9	Shallu forage, D. E. 75.....	0	.153	.022	.126
	Sorghum silage, average.....	0	.275	.060	.160
8223-4	Sorghum silage, No. 47.....	.054	.297	.056	.167
	Sorghum fodder, average.....	.090	.308	.013	.158
7991-2	Sorghum hay, No. 43.....	.090	.326	.016	.157
	Sudan hay, average.....	.116	.284	.013	.132
7763-4	Sudan hay, No. 39.....	.046	.126	.018	.144
7980-1	Sudan straw, seed removed, No. 42.....	.108	.182	.010	.119
9290-1	Sudan hay, No. 60.....	.137	.238	.006	.104
9408-9	Sudan hay, best quality, No. 62.....	.151	.321	.011	.132
10987-8	Sudan hay, some crab grass, D. E. 73.....	.135	.322	.017	.149
	Wheat shorts, white, average.....	.207	.514	— .050	.220
9629-30	Wheat shorts, D. E. 64.....	.216	.518	— .015	.246

Argentine Corn Chops Used in Digestion Experiment 56.

This was a yellow variety of corn, the grains having a peculiar reddish tint. The grains were small, thick, and very hard. The sample showed indications of the corn having been heated and then dried. The corn was chopped before it was fed.

According to the experiment, the corn has a greater feed value than the average corn chops. If we thereby conclude that Argentine corn chops is better than American corn chops, however, we would probably be in error, as one experiment is not sufficient to draw general conclusions.

Bermuda Hay Used in Digestion Experiment 72.

This hay was purchased in Bryan, Texas, and was of fair quality. It had a feeding value slightly above the average for Bermuda hay.

Corn Silage Used in Digestion Experiment 46.

This silage was made from strawberry corn harvested during the latter part of July, and after the kernels were well glazed. A quantity was brought to the laboratory daily, of which 750 grams were fed twice a day, making a total of 1500 grams. Five hundred grams were dried each day of the digestion period, which lasted six days. The preliminary

period was six days. This silage was furnished by the Feeding and Breeding Station at College Station.

The composition and feeding value were very near the average. Since corn silage contains about 75 per cent. water, the dry matter of corn silage has a high feeding value.

Cotton Seed Used in Digestion Experiment 65.

These seed were secured from the Feeding and Breeding Station, and probably represented the average run of Texas seed, although the seed were not very well ginned, and carried a considerable quantity of lint. The seed were cut, and the hulls and kernels analyzed separately. They were then combined by calculation, in the proportion of 53.3 per cent. kernels to 46.7 per cent. hulls.

Cotton seed contains more digestible protein, and has a slightly lower fat producing value, than corn chops. On account of its high oil content, which is liable to interfere with digestion, it should not be fed in quantity to exceed 5 pounds per 1000 pounds live weight.

Dolichos Lablab Hay Used in Digestion Experiment 45.

This hay was furnished by Mr. A. B. Conner, Agronomist, and was grown at Substation No. 3, Angleton, Texas. This hay contained 27 per cent. of large coarse stems, which were discarded. It contains more protein and has a slightly higher fat producing power than Bermuda hay.

Feterita Seed Used in Digestion Experiment 55.

This seed was in good condition, but had been to some extent infested with weevils, and evidently treated with carbon bisulphide.

This sample of feterita seed fed chopped had a higher feeding value than corn chops. On account of the small, hard character of the seeds, it should be ground or chopped before feeding. Otherwise, considerable proportion of the seed may escape digestion, and the corresponding feeding value be lost.

Feterita Fodder Used in Digestion Experiment 74.

This was furnished from Substation No. 7, Spur, Texas. The stalks were about one-half inch in diameter at the large end, and there were very few heads. The sheep did not eat the large stalks very well. The part that was eaten has about 50 per cent. more feeding value than milo fodder and about 25 per cent. more than kafir fodder.

Jack Beans Used in Digestion Experiment 59.

These beans were about the size of ordinary Lima beans, but were much thicker. They were clean, sound, and in good condition, but extremely tough, with a tendency to gum when chewed. They were chopped coarsely on a food chopper. This experiment was started with

two sheep, but one of the sheep refused to eat the beans entirely, and had to be removed from the experiment. The other sheep did not eat them very well. The beans were evidently distasteful to the animals.

What was eaten, was well digested, and the feed has a high feeding value. It is possible that if the beans were soaked in water, and the water poured off, they would be eaten more readily.

Dwarf Blackhul Kafir Fodder Used in Digestion Experiment 79.

This feed was composed of stalks averaging about $\frac{1}{2}$ inch in diameter at the large end. It was a little musty. It was furnished by Substation No. 8, Lubbock. There was no seed.

Its feeding value was lower than the corresponding product from milo or feterita.

Kafir Fodder Used in Digestion Experiment 70.

This consisted both of the heads and of the stalks and was furnished by Lester Henry, Texline, Texas. The stalks were coarse, averaging about one inch in diameter. The fodder was well cured, bright and clean. The heads were fully formed, but contained very little grain. The grain had evidently failed to develop. The stalks and the heads were prepared separately and mixed in the proportions, namely, 213 grams of stalks to 37 grams of heads. This quantity was weighed out for each ration. Heads and stalks (or stover) were analyzed separately, and combined by calculation.

This feed has a comparatively high feeding value.

Milo Head Chops Used in Digestion Experiment 5.

This consisted of the entire heads of the white and yellow milo, the grains being crushed and the stems torn to shreds. It was sound and in good condition. The sample was from the Feeding and Breeding Station, and had been ground there. It had a high feeding value.

In Digestion Experiment 66. The feed consisted of the entire head of milo chopped up and was sound and in good condition.

Milo Fodder Used in Digestion Experiment 80.

Secured from Substation No. 8, at Lubbock, Texas. This consisted of the stalk of milo. There was no seed.

It was better than kafir fodder, but not as good as feterita fodder.

Milo Fodder, Heads and Stalks Used in Digestion Experiment 71.

This consisted of the entire plant used for feeding purposes. The heads were well filled out and of medium size, and the stalks were mature, clean, and in good condition. The heads and stalks were separated, chopped and weighed into the rations separately in the proportions of 154

grams of heads to 96 grams of stalks as occurred in the sample. The sample was received from Lester Henry, Texline, Texas.

This feed was equal to wheat bran in productive value, though much lower in its content of digestible protein.

Moth Bean Hay Used in Digestion Experiment 44.

This was grown at Substation No. 3, at Angleton, Texas. It was planted July 4 in 6-foot rows, and germinated to a good stand in four days. On account of the dry weather of July and August, the growth was slow, and the plants bloomed, but failed to produce beans. When the early fall rains started in September, the vines put on new growth and were cut in this condition for hay, on November 8. The vines were cut with a hoe and taken immediately into a house and cured under shelter. This represents the hay of average quality.

It had practically the same feeding value as dolichos lablab hay, and a little lower than average alfalfa.

Peanut Hulls Used in Digestion Experiment 52.

This feed consisted of the crushed peanut hulls, containing the outside covering of the peanut kernels, or peanuts, with a small amount of peanut fragment. Some stems from the vine were also present.

These had a very low feeding value, and the feeding value present was probably due to the particles of meats left in them.

Peanut Hay With Nuts.

Hay used in Digestion Experiment 40: This consisted of the peanut vines carrying the nuts. The vines and nuts were separated and prepared and weighed separately into the rations. The rations consisted of 175 grams of vines and 75 grams of nuts. The peanuts with the vines contained 70 per cent. vines and 30 per cent. nuts. It was of good quality.

Peanut Hay with Nuts, used in Digestion Experiment 77, contained 136.8 grams peanuts to 163.2 grams hay. This hay was separated, prepared separately and weighed out separately in the rations at the rate of 135 grams of nuts to 165 grams of hay. The hay contained the leaves, stems, roots and the nuts. The peanuts were grown at Substation No. 11, at Nacogdoches, and were furnished through Mr. A. B. Conner.

Peanut hay with the nuts on is a rich feed, better than wheat bran. It has, however, a high fat content, and for this reason, and also on account of its high value, should be fed in connection with other roughage. If fed alone, it is a highly fattening food, and the animal would be liable to get too much fat so as to impair digestion.

Peanut Hay Without Nuts.

The feed used in Digestion Experiment No. 76, consisted of the hay from which the nuts had been removed. They were furnished by Substation No. 11, Nacogdoches, Texas, through Mr. A. B. Conner, Agronomist.

Peanut Hay used in Digestion Experiment 41 is the same feed as used in Digestion Experiment 40, and consisted of the hay from which the nuts had been removed.

Hay used in Digestion Experiment 69: This sample was secured by Mr. H. M. Eliot, of the Extension Service, from Mr. H. B. Shackelford, of Cross Plains, Texas. This hay contained only a small amount of nuts. The three samples gave closely agreeing results in productive values, though somewhat different in digestible protein. It is a good feed.

Peat Used in Digestion Experiment 67.

This peat was furnished by the Weidmer Chemical Company, of Saint Louis, and is a natural deposit which is dried and heated to a comparatively high temperature. The manufacturers do not claim a feeding value for this material, but claim that it acts as an absorbent to take up or counteract the bad effect of molasses or sweetened animal food. The material was labeled, "humus for fertilizer and stock food." It had the appearance somewhat of finely ground charcoal, except that it contained some finely divided brown to gray material.

The digestion experiment showed that this material was not only not digested, but that it apparently decreased the digestibility of the alfalfa hay, with which it was fed.

Prairie Hay.

Southwest Texas Prairie Hay, used in Digestion Experiment 38, was commercial southwest Texas prairie hay.

Prairie Hay used in Digestion Experiment 61 was cut from the wild prairie grass, the middle of June, 1914, on the experiment farm near Angleton. It grew on flat, poorly drained soil and had an abundance of rainfall until within three weeks of the time it was cut for hay. It was almost mature when cut. The hay consisted chiefly of two native wild grasses and a mixture of various weeds. The smell of bitterweed was very noticeable. The hay was furnished by Mr. N. E. Winters, Superintendent of Substation No. 3, Angleton, Texas.

Rhodes Grass Hay Used in Digestion Experiment 82.

This hay was furnished by Mr. E. H. Clark, La Feria, Texas, and was grown in the lower Rio Grande Valley. It was cut late, and is, therefore, somewhat more woody than the best quality of Rhodes grass hay would be. It has a good feeding value.

Rough Rice.

These three samples used in Digestion Experiments 49, 50, and 51, were furnished by Mr. E. A. Eignus, Secretary of the Southern Rice Growers' Association, at Beaumont, Texas, and consisted of the rough rice, that is, the grain and the husks, which had been ground up. The

rough rice used in Digestion Experiment 49 was "stack burnt," that is, had undergone a heat or fermentation while stacked up; that used in Digestion Experiment 50 was musty and damaged; that used in Digestion Experiment 51 was sound and of the best quality. All this rice was of the Honduras variety.

There is little difference in the feeding values of the three grades of rice as shown in the digestion experiments. Rough rice has a good feeding value. It should be ground, as otherwise the hard grains will escape mastication.

Rice Hay Used in Digestion Experiment 78.

This consists of second growth rice hay harvested when in milk to early dough stage. It was produced from stubble about seven weeks after the rice harvest, and yielded about one to one and a half tons to the acre. This hay was secured from Substation No. 4, Beaumont, Texas, through Mr. A. B. Conner, Agronomist.

The feeding value is not high, about the same as prairie hay.

Sorghum Silage Used in Digestion Experiment 47.

This silage was furnished by the Feeding and Breeding Station and was brought to the laboratory every day and 1500 grams fed to the animals. Five hundred grams were weighed out and dried for the estimation of dry matter. The silage was made from the Sumac variety, planted in cultivated rows, and was harvested in August as soon as the seed were entirely ripe.

This sorghum silage was 50 per cent. better than the average.

Sorghum Hay Used in Digestion Experiment 43.

This hay was of good quality. About half of the heads were not ripe. Its value was slightly below the average.

Shallu Fodder.

Furnished by Substation No. 8, at Lubbock, Texas. This forage was of good quality, although some of the stalks were rather large.

This is about equal to milo fodder and slightly better than kafir fodder.

Sudan Hay.

Sudan Hay used in Digestion Experiment 39 was cut when headed and approaching the milk stage.

Sudan Hay used in Digestion Experiment 60 was about four feet high and most of it in full tassel when cut.

Sudan Hay used in Digestion Experiment 62 was cut just before it was in full bloom and when it was well headed. It is supposed to have been cut at the best stage for making hay.

Sudan Hay used in Digestion Experiment 73 was a late cutting of

the Sudan Grass and some of it was rather coarse. There was also a high percentage of Crab Grass present, the amount being estimated at 40 per cent. Mr. A. B. Conner states that it is probable that in cutting, in a good many sections, the last cutting of Sudan Grass will contain considerable Crab Grass.

Sudan Hay varies from 0.8 to 7.2 in digestible protein and 6.1 to 8.6 in productive value. The average is about the same as Bermuda Hay. Cut at the best stage of growth, just before it was in full bloom, and when well headed, it had a productive value about the same as alfalfa, though the digestible protein was less.

Sudan Straw.

This was used in Digestion Experiment 42 and is Sudan Straw, after the seed crop has been removed, and the remaining straw baled up. It has a lower feeding value than Sudan Hay.

Wheat Shorts.

This sample was almost pure white and contained little of the bran particles. It is really almost a low grade flour, rather than wheat shorts. This sample was much better than average wheat shorts in digestibility. It was used in Digestion Experiment 64.

MAINTENANCE REQUIREMENTS.

In Experiments 72 to 82 we collected and analyzed the urine. The animal stood on an iron screen above a galvanized funnel. The urine went into a suitable receptacle. Every day it was made up to volume (usually 500 cc.) in a graduated flask, and two portions of 1 per cent. each measured out for analysis (usually 5 cc.). One-tenth of the urine was put into a bottle each day and at the end of the period, the combined aliquots were also subjected to analysis. The average daily analysis and the analysis of the total urine usually showed an excellent agreement. The average of all was taken to be the daily excretion of nitrogen. The urine was usually made up to 500 cc., but in some cases the excretions were excessive and it was made up to 2000 cc.

Table 4 shows the nitrogen digested and excreted and the nitrogen balance. It also shows the weights of the sheep from Experiment 76 on, and the productive value in terms of fat, of the feed digested. In Bulletin 170, we gave the maintenance ration of sheep of coarse breeds as being 1 pound proteids and 2.08 pounds production value per 100 pounds of live weight. This ration would be equivalent to 50 grams proteids and 104 grams productive value per 50 kg. sheep, which is approximately the sizes of those used in the experiments. This ration is not the ration which would just sustain the body, but permits growth of wool and some growth of body organs. The true maintenance requirements would thus be less.

TABLE 4. NITROGEN BALANCE AND PRODUCTIVE VALUE OF PROTEINS.

Feed.	Exp. No.	Total protein digested.	Daily protein digested.	Daily nitrogen digested.	Nitrogen in urine daily.	Loss or gain daily.	Weight of Sheep Kg. 1st & 2nd day.	Weight of Sheep Kg. 13th & 14th day.	Water drank at Av.	Productive value of feed digested, gm.
Bermuda hay—										
Sheep No. 1, 600 gms.	72	115.9	16.6	2.66	4.54	-1.88				
Sheep No. 2	72	120.7	17.2	2.75	4.35	-1.60				
Sudan grass—										
Sheep No. 1, 600 gms.	73	188.9	26.7	4.27	4.78	-0.51				
Sheep No. 2, 600 gms.	73	185.7	28.5	4.24	4.82	-0.58				
Fetulla forage—										
Sheep No. 1, 600 gms.	74	99.3	14.2	2.27	2.43	-0.16				
Sheep No. 2	74	102.8	14.7	2.35	3.08	-0.73				
Shall forage—										
Sheep No. 1, 600 gms.	75	-9.1	-1.3	-0.21	2.03	-2.24				
Sheep No. 2, 600 gms.	75									
Peanut hay—										
Sheep No. 1, 600 gms.	76	253.3	36.2	5.79	5.06	+0.73	51100	50370		65.1
Sheep No. 2	76	249.7	35.7	5.71	5.38	+0.33	48560	46630		61.9
Peanut hay and peanuts—										
Sheep No. 1, 600 gms.	77	441.9	63.1	10.10	8.64	+1.46	48890	50220		83.1
Sheep No. 2, 600 gms.	77	493.8	70.5	11.28	11.48	-0.20	54890	49950		87.2
Rice hay—										
Sheep No. 1	78	47.4	6.8	1.09	2.62	-1.53	49830	50220	778	14.4
Sheep No. 2	78	92.7	13.2	2.11	2.71	-0.60	45190	45740	1257	33.1
Kafir forage—										
Sheep No. 1	79	45.0	6.4	1.02	2.57	-1.55	44280	44340	1324	33.0
Sheep No. 2	79	20.0	2.9	0.46	3.25	-2.79	51115	47475	2009	19.0
Milo forage—										
Sheep No. 1	80	-23.0	-7.1	-1.14	1.97	-3.11	49500	48140	1117	16.0
Sheep No. 2	80	-2.9	-0.4	-0.06	1.50	-1.56	43340	43310	1507	27.0
Acuff sorgo forage—										
Sheep No. 1	81	14.7	2.1	0.34	1.36	-1.02	42245	41485	1182	26.0
Sheep No. 2	81	8.7	1.4	0.22	2.71	-2.49	52400	49130	2210	22.2
Rhodes grass hay—										
Sheep No. 1	82	73.9	10.4	1.66	3.75	-2.09	52850	52735	1310	25.5
Sheep No. 2	82	96.8	14.2	2.27	2.91	-0.64	50725	48360	2715	31.8

Only one of the rations studied furnished the 8 grams nitrogen in excess of the daily maintenance requirement for a 50 kg. sheep. This is No. 77, with peanut hay. There are gains of nitrogen when the ration contains 5 grams nitrogen (Experiment 76) and comparatively small losses with 4.78 grams per day. Some of the rations fed were very low in protein, and with these the animal was able to reduce its use of nitrogen to three grams per day in many cases, or even to two grams or less. This would be equivalent to 0.25 pounds proteids per 1000 pounds live weight. The actual body use is thus reduced to a very low amount, as is shown also in experiments on stormy days.

None of the rations examined had a productive value of 104 grams per 50 kg. sheep. Yet, to judge from the live weight, several of these rations maintained the weight of the animals. This occurs in the following cases:

Sheep No. 1, peanut hay,	83 grams productive value.
Sheep No. 2, rice hay,	33 grams productive value.
Sheep No. 3, rice hay,	19 grams productive value.
Sheep No. 2, kafir forage,	33 grams productive value.
Sheep No. 2, milo forage,	27 grams productive value.
Sheep No. 1, Rhodes grass hay,	26 grams productive value.

With other sheep on the same ration, as given in the table, weight was not maintained. These weights covered a period of 12 days. It has been pointed out by the Missouri Station that an animal may maintain its weight but lose in condition or fitness.* Therefore the maintenance of weight alone is an unsafe method of testing rations for maintenance. If we judged from the weights in these experiments, we might conclude that a ration containing 35 grams productive value is sufficient for the maintenance of a 50 kg. sheep. This would be equivalent to 0.7 pounds productive value instead of 2.08 per 1000 pounds live weight. We do not, however, draw this conclusion, but merely observe that the ration with 2.08 pounds productive value is probably more largely in excess of the maintenance requirements than it was supposed to be when formulated. Investigations along this line will be continued, for the knowledge of the maintenance requirements is important in studying the productive values of feed and of rations.

*Mo. Research Bul. 18.

TABLE 5. COMPOSITION OF FEEDS COMPILED.

Laboratory No.		Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.
	Feterita Seed.						
8125	Substation No. 5, Temple.....	13.27	3.39	2.66	67.73	10.75	2.20
8257	T. S. No. 81.....	12.60	3.20	2.32	69.85	10.15	1.88
8258	D. R. No. 60.....	12.46	2.89	1.96	70.37	10.88	1.44
8280	Temple.....	12.66	2.56	1.91	68.92	12.50	1.45
9411	.....	13.62	3.25	2.32	68.87	10.70	1.24
9634	Coleman.....	12.83	1.35	3.23	63.60	15.75	3.24
8318-9	Used in D. E. 55.....	13.83	2.93	2.15	69.90	9.51	1.68
3000	.....	10.21	2.40	2.80	74.22	8.77	1.60
	Average.....	12.69	2.75	2.42	69.18	11.13	1.84
	Jack Bean (Cornavalina ensiformia).						
4225	Mineola.....	21.84	3.74	7.85	49.81	14.26	2.50
7222	Texas Station No. 744.....	25.80	3.20	8.25	51.86	7.86	3.03
8742-3	Used in D. E. 59.....	27.18	2.87	8.14	49.41	9.56	2.86
	Average.....	24.94	3.27	8.08	50.36	10.56	2.79
	Peanut Hulls.						
2200	Texas.....	5.00	1.57	64.59	16.48	9.23	3.13
2201	Texas.....	4.75	0.56	66.81	14.93	10.15	2.80
11233-6	Texas.....	6.34	1.52	58.53	14.49	7.18	11.94
11562	Texas.....	6.26	0.57	63.01	17.89	8.43	3.84
11563	Texas.....	6.66	0.96	57.07	20.08	8.67	6.56
11570	Texas.....	5.00	0.57	65.75	17.96	8.61	2.11
10654	Texas.....	7.69	1.72	54.27	21.97	9.40	4.95
	Mass. 1906.....	7.10	1.90	62.20	19.00	7.00	2.80
	Georgia Bulletin 13.....	6.47	1.87	64.56	12.93	10.0	4.17
	Georgia Bulletin 13.....	4.49	1.90	71.30	9.61	10.0	2.70
	North Carolina 32, No. 11.....	4.56	0.81	67.31	14.62	10.0	2.70
	North Carolina 32, No. 11.....	6.13	0.82	65.32	18.54	5.47	3.72
	North Carolina 90b.....	8.54	.91	56.62	18.45	10.78	4.70
	Tenn. Vol 4, No. 2.....	5.82	1.21	66.88	15.45	8.81	1.83
	Tenn. Vol. 4, No. 2.....	7.87	2.15	65.18	13.36	7.81	3.63
	Mass. Bull. 56.....	4.99	1.65	66.04	13.14	12.98	1.18
	Average.....	6.10	1.29	63.47	16.18	9.03	3.92
	Hull with Meats Probably Present.						
	Farmers Bull. 25, German.....	6.90	3.19	62.08	14.53	10.50	2.80
	Farmers Bull. 25, German.....	7.32	3.31	59.64	16.23	10.30	3.20
8275-6	From factory.....	9.85	3.69	48.80	22.53	8.66	6.47
11430	From factory (some kernel and bran present).....	8.57	5.09	51.87	23.21	8.63	2.63
	Average.....	8.16	3.82	55.60	19.12	9.53	3.78
	Peanut Hay, Nuts Removed.						
	North Carolina Report, 1889.....	10.32	3.57	25.96	42.92	10.44	6.80
	Georgia Bull. 13, cut before bloom.....	11.43	5.67	22.32	41.57	10.00	9.01
	Georgia Bull. cut when fruit ripe.....	10.53	4.34	25.61	39.41	10.00	10.11
	Georgia Bull. cut before bloom.....	11.31	5.26	17.90	45.35	10.00	10.18
	North Carolina Bull. 90b.....	9.90	5.23	19.44	48.44	10.00	6.99
2068	Troup, Texas.....	9.38	2.13	25.67	48.84	8.11	5.89
	Tenn. Vol. 4, No. 2.....	10.81	1.69	20.44	43.56	7.83	15.67
	North Carolina Bull. 97.....	10.31	3.57	25.96	42.92	10.44	6.80
7975-6	Texas.....	7.72	2.41	22.71	49.50	8.86	8.81
7964-5	.....	7.59	2.34	21.62	47.86	11.87	8.72
9814-5	.....	10.31	3.57	25.96	42.92	10.44	6.80
11212-3	.....	9.43	3.03	27.87	44.55	8.38	7.24
11232-5	.....	9.70	3.31	27.39	42.21	8.67	8.72
	Average.....	9.90	3.54	23.75	44.61	9.61	8.59
	Peanut Hay, with Nuts.						
	New York Bull. 16.....	12.65	14.12	27.34	34.00	6.23	5.64
	Tex Bull. 147.....	13.56	8.56	22.82	39.02	8.60	7.44
	Texas, D. E. 40.....	11.05	11.96	21.66	37.60	10.71	7.02
	Texas, D. E. 77.....	15.64	17.83	23.16	29.19	7.20	6.98
	Average.....	13.22	13.12	23.75	34.95	8.19	6.77

TABLE 5. COMPOSITION OF FEEDS COMPILED—Continued.

Laboratory No.		Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.
	Texas Prairie Hay.						
607	Prairie hay.....	4.75	2.19	27.88	47.26	9.88	8.04
609	Farney hay.....	4.00	2.27	24.40	52.84	7.96	8.53
610	Prairie hay.....	4.62	2.66	33.45	43.99	7.28	8.00
4335	Prairie hay, South Texas.....	3.73	1.77	30.67	50.12	7.40	6.31
4365	Prairie hay, Brazos county.....	4.31	2.59	28.78	48.54	7.70	8.08
6064-5	South Texas, cut before frost, D. E. 22.....	4.37	2.05	29.28	47.93	9.13	7.24
6143-4	South Texas, cut after frost, D. E. 23.....	3.70	2.15	30.20	46.36	8.73	8.86
4243	Prairie hay.....	4.34	1.87	29.25	50.18	8.78	5.58
2952	Prairie hay.....	4.87	1.69	29.98	49.43	6.08	7.95
737	Farney hay.....	5.06	2.02	25.78	51.42	8.61	7.11
	Average.....	4.38	2.13	28.97	48.81	8.16	7.57
	Sudan Hay.						
9388	Second growth, cut at beginning of bloom.....	10.92	1.70	26.31	40.06	12.08	8.93
10601	Average quality Sudan hay.....	8.68	2.10	32.42	38.78	8.06	9.96
11279	Used in feeding experiment.....	8.94	1.72	31.32	44.09	5.88	8.05
11280	From Robstown, Texas, used in feeding experiment.....	6.50	1.33	33.61	42.20	5.96	10.40
11387	From Robstown, Texas, used in feeding experiment.....	9.47	1.46	30.35	39.00	7.94	11.78
7763-4	Headed, approaching milk stage, D. E. 39.....	4.42	1.47	30.63	47.88	10.43	5.17
9290-1	Cut in bloom, D. E. 60.....	10.75	1.73	30.99	38.23	9.44	8.87
9408-9	Cut in bloom and in good stage for hay D. E. 62.....	11.30	2.17	27.94	40.59	8.69	9.31
10987-8	Late cut, contains crab grass, D. E. 73.....	7.82	1.89	30.14	43.05	8.92	8.18
	Average.....	8.75	1.73	30.4	41.54	8.61	8.96
7980-1	Sudan straw, after seed gathered, D. E. 42.....	7.80	1.50	30.66	42.85	9.57	7.63

TABLE 6. REFERENCES.

1. Texas Bulletin 166.
2. Texas Bulletin 189.
3. Texas Bulletin 170.
4. Henry & Morrison's Feeds and Feeding.
5. See Table 4.
6. Texas Bulletin 191.

TABLE 7. COMPOSITION OF FEEDS, RESIDUE AND EXCREMENTS.

Laboratory No.		Protein	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.
7763	Sudan grass, D. E. 39, Sp. 1.....	4.23	1.51	30.28	48.15	10.71	5.12
7764	Sudan grass, D. E. 39, Sp. 2.....	4.60	1.43	30.97	47.64	10.15	5.21
7724	S. W. Texas, prairie hay, D. E. 38, Sp. 1.....	4.22	2.31	30.30	47.82	7.45	7.90
7725	S. W. Texas, prairie hay, D. E. 38, Sp. 2.....	4.38	2.58	30.82	46.76	7.76	7.70
7778	Residue, D. E. 38, Sheep 3.....	4.03	3.40	31.51	40.44	12.28	8.34
7779	Residue, D. E. 38, Sheep 4.....	4.84	3.97	29.45	40.08	12.11	9.55
7799	Excre. Sheep 3, D. E. 38, prairie hay.....	7.66	3.05	23.22	43.28	7.05	15.74
7800	Excre. Sheep 4, D. E. 38, prairie hay.....	9.61	3.04	23.77	40.84	6.73	15.98
7964	Peanut vines, D. E. 40, Sp. 1.....	7.37	2.17	22.53	47.36	11.95	8.62
7965	Peanut vines, D. E. 40, Sp. 2.....	7.80	2.51	20.71	48.37	11.79	8.82
7966	Peanut, D. E. 40, Sp. 1.....	19.69	34.42	21.29	13.46	8.10	3.04
7967	Peanut, D. E. 40, Sp. 2.....	18.59	34.38	22.18	13.79	8.00	3.06
7968	Residue, D. E. 39, Sheep 1.....	7.41	1.47	33.25	41.45	9.79	6.63

TABLE 7. COMPOSITION OF FEEDS, RESIDUE AND EXCREMENTS—Continued.

Laboratory No.		Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.
7969	Residue, D. E. 39, Sheep 2.	5.44	1.27	34.63	39.81	13.43	5.42
7970	Excre. Sheep 1, D. E. 39, sudan grass.	8.73	1.84	25.56	47.40	7.88	8.59
7971	Excre. Sheep 2, D. E. 39, sudan grass.	8.12	1.67	27.23	47.03	7.74	8.21
7975	Peanut vine hay, D. E. 41, Sp. 1.	7.97	2.26	22.71	49.08	9.06	8.92
7976	Peanut vine hay, D. E. 41, Sp. 2.	7.48	2.56	22.70	49.92	8.64	8.70
7977	Excre. Sheep 3, D. E. 40, peanut hay.	9.28	1.15	35.00	28.62	6.79	17.16
7978	Excre. Sheep 4, D. E. 40, peanut hay.	8.82	3.18	32.20	28.65	7.01	20.14
7980	Sudan grass, D. E. 42, Sp. 1.	7.95	1.58	31.50	42.12	9.42	7.43
7981	Sudan grass, D. E. 42, Sp. 2.	7.64	1.42	29.82	43.58	9.72	7.82
7989	Residue, D. E. 42, Sheep 1.	6.49	1.72	33.81	41.22	7.68	9.08
7990	Residue, D. E. 42, Sheep 2.	6.68	1.49	31.08	41.71	8.66	10.38
7991	Sorghum hay, D. E. 43, Sp. 1.	6.05	2.31	27.69	46.25	10.72	6.98
7992	Sorghum hay, D. E. 43, Sp. 2.	5.99	1.80	27.14	47.39	10.26	7.42
7996	Excre. D. E. 41, Sheep 3, peanut vines.	8.20	3.59	31.11	28.53	8.34	20.23
7999	Excre. D. E. 42, Sheep 1, sudan straw.	8.28	1.76	24.20	43.81	8.71	13.24
8000	Excre. D. E. 42, Sheep 2, sudan straw.	8.28	1.73	23.71	44.13	7.60	14.55
8001	Residue, D. E. 43, Sheep 3.	2.44	1.50	34.57	45.42	10.89	5.18
8002	Moth bean, D. E. 44, Sp. 1.	14.34	1.72	24.93	34.85	14.02	10.14
8003	Moth bean, D. E. 44, Sp. 2.	15.24	1.19	25.63	33.69	13.61	10.61
8009	Residue, D. E. 44, Sheep 1, moth bean.	10.54	1.11	11.85	17.02	6.33	53.15
8010	Residue, D. E. 44, Sheep 2, moth bean.	7.00	1.00	10.54	19.46	9.15	52.85
8011	Excre. D. E. 43, Sheep 3, sorghum hay.	8.78	1.81	25.53	43.50	7.99	12.39
8012	Excre. D. E., Sheep 4, sorghum hay.	9.81	2.12	25.61	41.56	7.58	13.32
8013	Excre. D. E. 44, Sheep 1, moth bean.	12.10	3.11	28.50	29.14	8.68	18.47
8014	Excre. D. E. 44, Sheep 2, moth bean.	11.04	3.10	29.22	28.31	7.71	20.62
8108	Dolichos lablab hay, D. E. 45, Sp. 1.	14.60	1.22	34.17	33.40	9.99	6.62
8109	Dolichos lablab hay, D. E. 45, Sp. 2.	15.04	1.50	33.06	33.82	9.71	6.87
8121	Residue, dolichos hay, Sheep 1, D. E. 45.	8.33	0.64	46.02	30.37	7.63	7.01
8122	Residue, dolichos hay, Sheep 2, D. E. 45.	7.87	0.72	49.16	28.41	7.28	6.56
8123	Excre. D. E. 45, Sheep 1, dolichos hay.	11.08	1.82	36.49	30.15	7.71	12.75
8124	Excre. D. E. 45, Sheep 2, dolichos hay.	10.06	1.56	38.83	30.06	7.28	12.21
8168	Corn silage, D. E. 46, Sp. 1.	1.93	1.38	7.55	13.67	74.79	1.67
8169	Corn silage, D. E. 46, Sp. 2.	2.09	1.55	7.28	13.55	74.51	2.02
8170	Excre. D. E. 46, Sheep 4, corn silage.	10.66	1.85	24.41	41.96	7.59	13.53
8196	Rough rice (No. 1) dry stack burnt type.	8.55	1.20	7.01	67.31	12.28	3.65
8197	Rough rice (No. 4) sound rice.	7.96	1.47	7.99	66.38	12.09	4.11
8198	Rough rice (X) a musty and damaged grade.	7.98	1.13	6.36	68.86	12.33	3.34
8223	Sorghum silage, D. E. 47, Sp. 1.	2.18	1.90	6.20	21.46	67.20	2.06
8224	Sorghum silage, D. E. 47, Sp. 2.	1.76	1.81	7.52	18.07	69.63	2.21
8225	Excre. Sheep 3, D. E. 47, sorghum silage.	10.85	2.20	22.46	44.49	7.28	12.72
8226	Excre. Sheep 4, D. E. 47, sorghum silage.	10.67	2.31	20.03	47.94	6.48	12.57
8227	Alfalfa hay, D. E. 48, Sp. 1.	12.50	1.55	30.66	39.47	8.12	7.70
8228	Alfalfa hay, D. E. 48, Sp. 2.	11.54	1.26	33.04	38.87	8.02	7.27
8245	Rough rice (No. 1) D. E. 49, Sp. 1.	8.63	1.55	8.73	67.29	9.92	3.88
8246	Rough rice (No. 1) D. E. 49, Sp. 2.	8.72	1.60	8.25	67.12	10.06	4.25
8249	Excre. Sheep 5, D. E. 48, alfalfa hay.	9.08	2.93	44.75	25.56	8.77	8.91
8250	Excre. Sheep 6, D. E. 48, alfalfa hay.	9.65	2.89	44.50	27.02	7.68	8.26
8251	Rough rice No. (X), D. E. No. 50, Sp. 1.	7.86	1.23	9.76	65.49	11.33	4.33
8252	Rough rice No. (X), D. E. No. 50, Sp. 2.	8.40	1.78	6.87	68.66	11.91	3.38
8269	Rough rice, No. 4, D. E. 51, Sp. 1.	8.01	1.60	9.51	66.39	9.82	4.67
8270	Rough rice, No. 4, D. E. 51, Sp. 2.	8.19	1.42	7.13	69.39	10.17	3.70
8271	Excre. D. E. 49, Sp. 5, alfalfa and rice No. 1.	8.27	2.29	41.88	28.02	7.18	12.35
8272	Excre. D. E. 49, Sp. 6, alfalfa and rice No. 1.	8.80	2.03	41.64	27.69	7.88	11.96
8273	Excre. D. E. 50, Sp. 5, alfalfa and rice, No. (X).	9.50	2.20	41.51	28.26	6.64	11.89
8274	Excre. D. E. 50, Sheep 6, alfalfa and rice No. (X).	10.17	2.28	41.55	27.90	7.09	11.01
8275	Peanut hulls, D. E. 52, sam. 1.	9.47	3.75	49.98	20.25	9.85	6.70
8276	Peanut hulls, D. E. 52, sam. 2.	10.22	3.63	47.62	24.82	7.47	6.24
8291	Excre. Sheep 5, D. E. 51, alfalfa and rice.	8.71	2.37	42.24	27.15	7.79	11.76
8292	Excre. Sheep 6, D. E. 51, alfalfa and rice.	9.38	2.32	41.07	27.43	7.94	11.86
8297	Excre. Sheep 5, D. E. 52, alfalfa and peanut hulls.	7.35	1.21	53.93	19.78	7.49	10.24
8298	Excre. Sheep 6, D. E. 52, alfalfa and peanut hulls.	6.69	1.18	56.90	19.22	7.65	8.36
8316	Alfalfa hay, D. E. 54, Sp. 1.	9.24	1.77	39.84	33.68	8.78	7.69
8317	Alfalfa hay, D. E. 54, Sp. 2.	11.14	2.15	35.30	34.49	9.00	7.92
8318	Peterita seed, D. E. 55, Sp. 1; 300 gms.	14.07	2.89	1.98	69.51	9.78	1.77
8319	Peterita seed, D. E. 55, Sp. 2; 150 gms.	13.58	2.96	2.32	70.32	9.24	1.58
8397	Excre. Sheep 5, D. E. 53, alfalfa.	8.49	2.19	45.89	26.45	7.29	9.69
8398	Excre. Sheep 6, D. E. 53, alfalfa.	8.58	2.52	44.14	27.44	7.36	9.96
8399	Residue Sheep 5, Per. 1 and 2, D. E. 53, alfalfa.	7.58	1.88	44.16	30.34	7.78	8.26
8404	Excre. Sheep 1, D. E. 54, alfalfa.	8.10	2.09	45.30	28.19	6.59	9.73
8405	Excre. Sheep 2, D. E. 54, alfalfa.	8.31	1.83	45.61	28.06	6.58	9.01

TABLE 7. COMPOSITION OF FEEDS, RESIDUE AND EXCREMENTS—Continued.

Laboratory No.		Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.
8406	Argentine corn, D. E. 56, Sp. 1.....	10.31	4.81	1.97	71.37	10.07	1.47
8407	Argentine corn, D. E. 56, Sp. 2.....	10.40	4.65	1.94	71.45	10.11	1.45
8408	Residue Sheep 1, D. E. 54, alfalfa hay.....	10.64	1.58	38.81	32.74	6.69	9.54
8580	Excre. Sheep 1, D. E. 55, alfalfa hay and feterita.....	9.34	2.76	43.01	30.13	6.53	8.23
8581	Excre. Sheep 2, D. E. 55, alfalfa hay and feterita.....	10.85	3.95	41.15	28.92	6.44	8.69
8589	Residue, D. E. 55, Sheep 2 per. 1 and 2.....	9.98	1.32	37.34	33.68	7.98	9.70
8590	White and red milo maize, D. E. 57, Sp. 1.....	8.63	2.13	7.63	69.15	9.13	3.33
8591	White and red milo maize, D. E. 57, Sp. 2.....	8.60	2.28	7.10	69.28	9.21	3.53
8593	Excre. Sheep 1, D. E. 56, alfalfa hay and Argentine corn chops.....	10.73	2.82	42.22	29.01	6.76	8.46
8594	Excre. Sheep 2, D. E. 56, alfalfa hay and Argentine corn chops.....	10.56	2.96	41.54	29.67	6.02	9.25
8792	Excre. Sheep 1, D. E. 57, alfalfa hay, maize head chops.....	10.40	2.09	38.29	33.01	6.01	10.20
8793	Excre. Sheep 2, D. E. 57, alfalfa hay, maize head chops.....	9.74	2.23	39.21	31.41	6.98	10.43
8742	Jack bean.....	27.42	2.80	8.01	49.40	9.54	2.83
8743	Jack bean.....	26.94	2.93	8.26	49.42	9.57	2.88
8795	Excre. Sheep 1, D. E. 58, alfalfa hay.....	8.19	2.24	45.82	29.11	5.54	9.10
8796	Excre. Sheep 2, D. E. 58, alfalfa hay.....	8.10	2.15	45.68	27.65	5.77	10.65
8797	Residue Sheep 1, D. E. 58, alfalfa hay.....	13.10	1.22	37.32	27.74	8.13	12.49
8798	Residue Sheep 2, D. E. 58, alfalfa hay.....	13.20	1.33	37.82	29.87	8.47	9.31
8823	Residue Sheep 2, D. E. 59, Jack bean.....	26.76	2.42	9.02	49.27	9.42	3.11
8822	Excre. Sheep 2, D. E. 59, alfalfa hay and Jack bean.....	12.51	2.40	41.51	26.94	7.55	8.69
8824	Residue Sheep 2, D. E. 59, alfalfa hay.....	18.69	1.83	26.89	36.13	10.56	5.90
9290	Sudan grass, Sp. 1, D. E. 60.....	10.29	1.63	30.38	39.42	9.54	8.74
9291	Sudan grass, Sp. 2, D. E. 60.....	11.20	1.83	31.60	37.04	9.33	9.00
9342	Excre. Sheep 1, D. E. 60.....	9.06	1.88	25.09	43.05	8.03	12.89
9343	Excre. Sheep 2, D. E. 60.....	8.55	1.84	24.90	43.96	7.39	13.36
9344	Residue, D. E. 60, Sheep 1.....	11.82	1.63	28.11	35.79	7.21	15.44
9345	Residue, D. E. 60, Sheep 2.....	8.51	1.33	36.71	36.24	6.67	10.54
9337	Prairie hay, D. E. 61, Sp. 1.....	4.83	1.98	32.09	45.11	9.03	6.96
9338	Prairie hay, D. E. 61, Sp. 2.....	5.14	2.03	32.32	45.26	8.29	6.96
9371	Excre. D. E. 61, Sheep 1.....	7.15	2.94	27.52	42.84	7.18	12.37
9372	Excre. D. E. 61, Sheep 2.....	6.95	1.89	28.29	43.52	7.29	12.06
9374	Residue, D. E. 61, Sheep 1.....	3.39	1.07	38.88	36.29	7.45	12.92
9375	Residue, D. E. 61, Sheep 2.....	3.72	1.41	42.08	36.18	7.26	9.35
9408	Sudan grass, D. E. 62, Sp. 1.....	11.23	2.11	28.25	40.30	8.89	9.22
9409	Sudan grass, D. E. 62, Sp. 2.....	11.37	2.23	27.63	40.88	8.49	9.40
9529	Residue, D. E. 62, Sheep 1.....	12.03	1.75	18.38	32.35	3.76	31.73
9530	Residue, D. E. 62, Sheep 2.....	11.99	1.70	28.79	39.01	5.08	13.43
9531	Excre. D. E. 62, Sheep 1.....	9.59	1.88	24.20	41.77	5.22	17.34
9532	Excre. D. E. 62, Sheep 2.....	8.19	1.83	24.61	42.82	5.32	17.23
9537	Alfalfa hay, Sp. 1, D. E. 63, 8.....	12.81	1.53	36.38	35.40	6.42	7.46
9538	Alfalfa hay, Sp. 2, D. E. 63, 8.....	11.82	1.39	37.42	34.95	6.38	8.04
9629	Conc. D. E. 64, Sp. 1, wheat shorts.....	16.68	2.47	1.04	68.91	9.94	.96
9630	Conc. D. E. 64, Sp. 2, wheat shorts.....	15.34	2.56	1.16	70.16	9.80	.98
9676	Excre. D. E. 63, Sheep 1.....	9.64	2.72	46.63	26.83	5.56	8.62
9677	Excre. D. E. 63, Sheep 2.....	9.39	2.70	46.96	25.93	5.78	9.24
9688	Cottonseed kernels 53.3 per cent meats, D. E. 65, Sp. 1.....	41.68	31.96	2.47	14.44	4.97	4.48
9689	Cottonseed kernels 53.0, D. E. 65, Sp. 2.....	40.15	31.23	2.25	17.01	4.88	4.48
9726	Cottonseed hulls, 46.7, D. E. 65, Sp. 1, No. 9688.....	4.20	.57	51.82	32.69	7.88	2.84
9727	Cottonseed hulls, 47.0 per cent, D. E. 65, Sp. 2, No. 9689.....	3.96	.51	51.91	32.89	7.53	3.20
XA	Cottonseed (from 9688-9 and 9726-7).....						
9728	Residue, D. E. 64, Sheep 1.....	16.31	1.70	9.31	62.61	5.03	5.04
9729	Residue, D. E. 64, Sheep 2.....	15.65	1.78	8.28	62.85	5.51	5.93
9730	Excre. D. E. 64, Sheep 1.....	12.42	3.57	40.87	27.48	5.44	10.20
9731	Excre. D. E. 64, Sheep 2.....	11.75	3.72	41.43	27.44	5.58	10.08
9733	Milo head chops, D. E. 66, Sp. 1.....	9.74	2.72	7.30	67.96	9.35	2.93
9734	Milo head chops, D. E. 66, Sp. 2.....	10.14	2.74	6.51	67.58	9.85	3.18
9738	Excre. D. E. 65, Sheep 1.....	13.28	2.72	43.39	21.93	6.32	7.36
9739	Residue, D. E. 65, Sheep 1.....	19.06	2.14	.....	.....	5.70	14.28
9740	Residue, D. E. 65, Sheep 2.....	13.80	1.95	.....	.....	5.55	17.71
9741	Excre. D. E. 65, Sheep 2.....	12.42	2.69	43.81	26.78	6.50	7.80
9761	Residue, D. E. 66, Sheep 1.....	10.70	.....	.....	.....	.....	8.36
9762	Residue, D. E. 66, Sheep 2.....	12.43	.....	.....	.....	.....	9.70
9763	Excre. D. E. 66, Sheep 1.....	11.41	2.75	39.46	31.12	5.98	9.28
9764	Excre. D. E. 66, Sheep 2.....	11.30	2.74	38.99	31.79	5.86	9.32

TABLE 7. COMPOSITION OF FEEDS, RESIDUE AND EXCREMENTS—Continued.

Laboratory No.		Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.
9771	Residue, D. E. 67, Sheep 1.	17.54	.49	10.44	37.81	6.66	27.06
9772	Residue, D. E. 67, Sheep 2.	17.81	1.55	9.19	39.33	6.91	26.21
9773	Excre. D. E. 67, Sheep 1.	14.07	1.53	29.80	32.30	6.05	16.45
9774	Excre. D. E. 67, Sheep 2.	13.37	1.48	30.56	32.58	4.82	17.19
9811	Excre. D. E. 68, Sheep 1.	9.89	2.21	45.15	27.19	5.90	8.66
9812	Excre. D. E. 68, Sheep 2.	9.72	2.91	45.68	26.46	5.82	9.41
9814	Peanut hay, D. E. 69.	9.99	3.28	24.46	45.65	6.91	9.71
9815	Peanut hay, D. E. 69.	10.31	3.97	22.21	43.22	7.28	13.01
9949	Kafir heads, D. E. 70.	9.00	1.39	21.47	50.63	13.19	4.32
9950	Kafir heads, D. E. 70.	9.55	1.27	21.65	49.62	13.59	4.32
9951	Kafir stalks, D. E. 70.	7.23	1.67	25.42	44.98	12.98	8.61
9952	Kafir stalks, D. E. 70.	6.82	1.58	25.84	44.31	13.00	8.45
9956	Excre. Sheep 3, D. E. 69.	8.97	2.57	32.24	25.42	6.16	24.64
9957	Excre. Sheep 6, D. E. 69.	8.08	2.54	30.03	25.13	5.09	28.53
9958	Residue, Sheep 3, D. E. 69.	1.93	.63	4.67	6.07	.94	85.76
10139	Residue, Sheep 3, D. E. 70.	5.00	1.64	36.74	43.03	6.38	7.21
10140	Excre. Sheep 2, D. E. 70.	9.28	2.20	24.44	42.80	6.05	15.23
10141	Excre. Sheep 3, D. E. 70.	8.16	2.14	24.34	43.06	6.46	15.84
10185	Excre. Sheep 3, D. E. 71.	12.07	1.84	22.27	44.52	6.06	13.24
10186	Excre. Sheep 3, D. E. 71.	10.21	1.74	22.15	46.52	6.31	13.07
10187	Residue, Sheep 3, D. E. 71.	2.12	1.10	37.12	39.01	10.39	10.26
10042	Milo heads, D. E. 71.	8.45	2.31	7.40	68.46	10.04	3.34
10043	Milo heads, D. E. 71.	8.19	2.36	7.35	67.45	11.35	3.30
10044	Milo stalk, D. E. 71.	2.90	1.21	31.86	45.46	8.13	10.44
10045	Milo stalk.	2.98	1.46	31.99	44.52	8.68	10.37
10981	Bermuda hay, Sample No. 1, D. E. 72.	5.91	1.65	26.80	50.52	7.26	7.86
10982	Bermuda hay, Sample No. 2, D. E. 72.	6.09	1.62	27.01	48.72	8.19	8.37
11102	Excre. Sheep 2, D. E. 72.	6.53	1.53	27.08	46.00	6.55	12.11
11103	Excre. Sheep 1, D. E. 72.	7.04	1.58	26.13	46.08	6.54	12.63
11104	Residue, Sheep 2, D. E. 72.	6.91	1.32	30.10	38.92	7.37	15.38
11105	Residue, Sheep 1, D. E. 72.	6.04	1.21	33.61	36.62	8.32	14.20
10987	Sudan grass, Sample No. 1, D. E. 73.	7.85	1.90	29.56	43.11	9.31	8.27
10988	Sudan grass, Sample No. 2, D. E. 73.	7.79	1.88	30.72	42.99	8.52	8.10
11123	Residue, Sheep 1, D. E. 73.	5.25	1.24	35.90	41.54	9.35	6.72
11133	Excre. Sheep 1, D. E. 73.	7.70	1.63	27.40	42.08	8.05	13.14
11134	Excre. Sheep 2, D. E. 73.	8.46	1.93	26.34	41.54	8.14	13.59
11127	Peterita forage, Sample No. 1, D. E. 74.	5.56	1.91	28.72	42.68	12.64	8.49
11128	Peterita forage, Sample No. 2, D. E. 74.	4.75	1.46	29.69	41.10	14.79	8.21
11136	Residue, Sheep 1, D. E. 74.	2.75	1.49	34.66	48.41	6.91	5.78
11137	Residue, Sheep 2, D. E. 74.	2.35	1.65	33.67	47.14	9.30	5.89
11142	Excre. Sheep 1, D. E. 74.	7.44	1.70	26.55	43.02	5.93	15.36
11143	Excre. Sheep 2, D. E. 74.	7.54	2.07	24.79	42.79	5.61	17.20
11138	Shallu forage, Sample No. 1, D. E. 75.	2.78	1.30	35.98	44.99	7.23	7.72
11139	Shallu forage, Sample No. 2, D. E. 75.	2.80	1.39	34.91	46.15	6.72	8.03
11209	Excre. Sheep 2, D. E. 75.	6.50	1.91	23.95	44.79	6.61	16.24
11210	Residue, Sheep 2, D. E. 75.	1.57	0.92	39.07	43.22	8.54	6.68
11212	Peanut hay, Sample No. 1, D. E. 76.	9.66	3.34	27.48	43.47	8.85	7.20
11213	Peanut hay, Sample No. 2, D. E. 76.	9.19	2.72	28.27	44.63	7.91	7.28
11242	Excre. Sheep 1, D. E. 76.	9.00	2.83	38.60	28.10	7.70	13.77
11243	Excre. Sheep 2, D. E. 76.	9.35	2.19	38.16	29.65	7.41	13.24
11232	Peanut hay, Sample No. 1, D. E. 77.	9.16	2.75	28.03	42.73	8.63	8.70
11235	Peanut hay, Sample No. 2, D. E. 77.	10.24	3.87	26.75	41.68	8.71	8.75
11234	Peanut kernels, Sample No. 1, D. E. 77.	28.63	47.21	4.26	12.45	5.04	2.41
11237	Peanut kernels, Sample No. 2, D. E. 77.	28.26	46.66	3.74	14.25	4.61	2.48
11233	Peanut hulls, Sample No. 1, D. E. 77.	6.38	1.59	58.56	14.53	7.07	11.87
11236	Peanut hulls, Sample No. 2, D. E. 77.	6.29	1.45	58.51	14.45	7.29	12.01
11261	Residue, Sheep 1, D. E. 77.	21.32	20.82	20.47	16.65	5.61	6.13
11281	Excre. Sheep 1, D. E. 77.	8.72	2.37	31.85	32.74	6.13	18.19
41282	Excre. Sheep 3, D. E. 77.	9.25	2.54	34.23	33.95	5.87	14.16
11259	Rice hay, Sample No. 1, D. E. 78.	5.63	1.09	30.90	39.88	7.36	15.14
11260	Rice hay, Sample No. 2, D. E. 78.	5.69	1.65	31.08	39.94	6.54	15.10
11301	Residue, Sheep 1, D. E. 78.	4.91	1.27	32.62	39.06	2.32	14.82
11302	Residue, Sheep 2, D. E. 78.	3.76	0.77	34.85	39.07	7.33	14.22
11308	Excre. Sheep 1, D. E. 78.	6.48	1.09	26.29	34.36	6.46	25.32
41309	Excre. Sheep 2, D. E. 78.	6.33	1.02	22.63	36.80	6.40	26.82
11299	Dwarf black hulled kafir forage, Sample No. 1, D. E. 79.	5.25	1.94	31.43	45.22	6.32	9.84
11200	Dwarf black hulled kafir forage, Sample No. 2, D. E. 79.	5.19	1.97	30.33	46.28	6.48	9.75
11354	Residue, Sheep 2, D. E. 79.	3.32	1.78	31.89	46.33	6.73	9.95
11355	Residue, Sheep 3, D. E. 79.	3.25	1.62	27.86	44.34	6.76	15.87
11373	Excre. Sheep 2, D. E. 79.	7.44	1.90	23.94	41.80	6.12	19.90
11374	Excre. Sheep 3, D. E. 79.	7.10	1.58	28.87	40.72	6.68	15.05
11352	Standard milo maize forage, Sample No. 1, D. E. 80.	3.29	1.54	34.16	44.78	6.43	9.80

TABLE 7. COMPOSITION OF FEEDS, RESIDUE AND EXCREMENTS—Continued.

Laboratory No.		Protein.	Ether extract.	Crude fibre.	Nitrogen free extract.	Water.	Ash.
11353	Standard milo maize forage, Sample No. 2, D. E. 80.	3.38	1.63	32.77	45.19	6.39	10.64
11436	Residue, Sheep 1, D. E. 80.	2.75	1.37	32.81	43.90	10.01	9.16
11437	Residue, Sheep 2, D. E. 80.	2.13	1.41	33.82	42.77	9.91	9.96
11487	Excre. Sheep 1, D. E. 80.	8.69	1.36	20.03	41.27	6.62	22.03
11488	Excre. Sheep 2, D. E. 80.	7.54	1.23	23.03	45.11	6.56	16.53
11438	Acuff sorgo forage, Sample No. 1, D. E. 81.	4.22	1.38	32.39	42.96	7.46	11.59
11439	Acuff sorgo forage, Sample No. 2, D. E. 81.	3.91	1.34	31.24	44.76	7.29	11.46
11502	Residue, Sheep 2, D. E. 81.	2.41	.77	34.74	40.17	11.44	10.47
11503	Residue, Sheep 3, D. E. 81.	2.69	0.87	33.48	40.78	10.38	11.80
11524	Excre. Sheep 2, D. E. 81.	7.10	1.74	22.18	43.34	6.81	18.83
11525	Excre. Sheep 3, D. E. 81.	6.57	1.44	24.59	42.20	8.55	16.65
11504	Rhodes grass hay, Sample No. 1, D. E. 82	5.44	1.67	32.35	42.37	7.26	10.91
11505	Rhodes grass hay, Sample, No. 2, D. E. 82	5.44	1.69	31.88	43.78	7.15	10.06
11561	Residue, Sheep 1, D. E. 82.	4.97	1.48	32.16	43.90	7.78	9.71
11567	Excre. Sheep 1, D. E. 82.	7.69	2.35	21.81	42.11	7.53	18.51
11568	Excre. Sheep 2, D. E. 82.	6.61	1.98	25.09	43.11	6.54	16.67
9748	Peat, Sample No. 1, D. E. 67.	17.14	.90	7.45	37.32	10.19	27.00
9749	Peat, Sample No. 2, D. E. 67.	17.10	.75	12.58	32.47	10.00	27.10

TABLE 8. NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD.

	Protein.	Ether extract.	Crude fiber.	Nitrogen free extract.	Water.	Ash.
Digestion Period No. 38 With Prairie Hay. Sheep No. 3—						
Fed 4000 gms. 8 days. No. 7724-5..	172.00	98.00	1222.40	1892.00	.....	312.00
Residue 97 gms. No. 7778.	3.91	3.30	30.56	39.23	.....	8.08
Eaten.....	168.09	94.70	1181.84	1852.77	.....	303.02
Excreted 2127 gms. No. 7799.	162.92	64.87	493.89	920.57	.....	334.79
Digested.....	5.17	29.83	687.95	932.20	.....	—31.77
Percentage digested.....	3.08	31.50	58.21	50.31	.....	.....
Sheep No. 4—						
Fed 4000 gms.	172.00	98.00	1222.40	1892.00	.....	312.00
Residue 50 gms. No. 7779.	2.42	1.98	14.73	20.04	.....	4.78
Eaten.....	169.58	96.02	1207.67	1871.96	.....	307.22
Excreted 1953 gms. No. 7800.	187.68	59.37	464.23	797.61	.....	312.10
Digested.....	—18.1	36.65	743.44	1074.35	.....	—4.88
Percentage digested from prairie hay.	0	38.17	61.56	57.45	.....	.....
Average percentage prairie hay digested.....	0	34.84	59.89	53.88	.....	.....
Digestion Period No. 39 With Sudan Grass. Sheep No. 1—						
Fed 4000 gms. No. 7763-4.	176.80	58.80	1225.20	1916.00	.....	206.80
Residue 25 gms. No. 7968.	1.90	.40	8.30	10.40	.....	1.70
Eaten.....	174.90	58.40	1226.90	1905.60	.....	205.10
Excreted 1662 gms. No. 7970.	145.10	30.60	424.8	787.8	.....	142.8
Digested.....	29.8	27.8	802.1	1117.8	.....	62.3
Percentage digested.....	17.04	47.60	65.62	58.66	.....	30.38
Sheep No. 2—						
Fed 4000 gms.	176.8	58.8	1225.2	1916.0	.....	6.8
Residue 46 gms. No. 7969.	2.5	.6	15.9	18.3	.....	2.5
Eaten.....	174.3	58.2	1209.3	1897.7	.....	204.3
Excreted 1751 gms. No. 7971.	142.2	29.2	476.8	823.5	.....	143.8
Digested.....	32.1	29.0	732.5	1074.2	.....	60.6

TABLE 8. NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD.
—Continued.

	Protein.	Ether extract.	Crude fiber.	Nitro- gen free extract.	Water.	A h.
Percentage digested from sudan grass.....	18.42	49.83	60.57	56.61	.....	29.61
Average percentage sudan grass digested.....	17.73	48.72	63.10	57.64	.....	30.00
Digestion Period No. 40 With Peanut Hay and Peanuts. Sheep No. 3—						
Fed 2800 gms. hay, No. 7964-5 and 1200 gms. nuts, No. 7966-7.....	212.5 229.7	65.6 412.8	605.4 260.9	1340.1 163.6	332.4 96.6	244.2 36.6
Total fed.....	442.2	478.4	866.3	1503.7	429.0	280.8
Eaten.....	442.2	478.4	866.3	1503.7	429.0	280.8
Excreted 1396 gms. No. 7977.....	129.5	44.0	488.6	399.5	94.8	239.6
Digested.....	312.7	434.4	377.7	1104.2	334.2	41.2
Digested from hay.....	135.0	32.1	320.9	1074.8	225.0	51.5
Digested from peanuts.....	177.7	402.3	56.8	29.8	109.2	0
Percentage digested from hay with nuts.....	70.71	90.80	43.60	73.43	77.90	14.67
Percentage digested from peanuts.....	77.24	97.63	21.76	18.16	11.24	0
Sheep No. 4—						
Eaten.....	442.2	478.4	866.3	1503.7	429.0	280.8
Excreted 1386 gms. No. 7978.....	122.2	44.1	446.3	397.1	97.2	279.1
Digested.....	320.0	434.3	420.0	1106.6	331.8	1.7
Digested from hay.....	135.0	32.1	320.9	1074.8	225.0	51.5
Digested from peanuts.....	185.0	402.2	99.1	31.8	106.8	0
Percentage digested from hay with nuts.....	72.37	90.78	48.48	73.59	77.35	.60
Percentage digested from peanuts.....	80.41	97.61	37.96	19.38	11.0	0
Average percentage digested hay with nuts.....	71.54	90.79	46.04	73.51	77.62	7.64
Average percentage digested peanuts.....	78.82	97.62	29.86	18.77	11.12	0
Digestion Period No. 41 With Peanut Vine. Sheep No. 3—						
Fed 4000 gms. No. 7975-6.....	308.8	96.4	908.4	1980.4	354.0	352.4
Residue 0 gms.....	0.0	0.0	0.0	0.0	0.0	0.0
Eaten.....	308.8	96.4	908.4	1980.4	354.0	352.4
Excreted 1373 gms. No. 7996.....	112.6	49.3	427.1	391.7	114.5	277.8
Digested.....	196.2	47.1	481.3	1588.7	239.5	74.6
Percentage digested.....	63.54	48.86	52.98	80.22	67.66	21.14
Digestion Period No. 42 With sudan Straw. Sheep No. 1—						
Fed 4000 gms. No. 7980-1.....	312.0	60.0	1226.4	1714.0	.....	305.2
Residue 122 gms. No. 7989.....	7.9	2.1	41.5	50.4	.....	11.1
Eaten.....	304.1	57.9	1184.9	1663.6	.....	294.1
Excreted 2119 gms. No. 7999.....	175.5	37.3	512.8	928.3	.....	280.6
Digested.....	128.6	20.6	672.1	735.3	.....	13.5
Percentage digested.....	42.29	25.58	56.72	44.20	.....	4.59
Sheep No. 2—						
Fed 4000 gms.....	312.0	60.0	1226.4	1714.0	.....	305.2
Residue 15 gms. No. 7990.....	1.0	2.2	4.6	6.3	.....	1.6
Eaten.....	311.0	57.8	1221.8	1707.7	.....	303.6
Excreted 1889 gms. No. 8000.....	156.4	32.7	447.9	833.6	.....	274.8
Digested.....	154.6	25.1	773.9	874.1	.....	28.8

TABLE 8. NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD.
—Continued.

	Protein.	Ether extract.	Crude fiber.	Nitro- gen free extract.	Water.	Ash.
Sheep No. 2—Continued.						
Percentage digested from sudan straw.....	49.71	43.43	63.34	51.19	.....	9.49
Average percentage sudan straw digested.....	45.90	34.51	60.03	47.70	.....	6.84
Digestion Period No. 43 With Sorghum Hay.						
Sheep No. 3—						
Fed 4000 gms. No. 7991-2.....	240.8	82.4	1096.8	1852.8	419.6	288.0
Residue 133 gms. No. 8001.....	3.2	2.0	46.0	60.4	14.5	6.9
Eaten.....	237.6	80.4	1050.8	1792.4	405.1	281.1
Excreted 1600 gms. No. 8011.....	140.5	29.0	408.5	696.0	127.8	198.2
Digested.....	97.1	51.4	642.3	1096.4	277.3	82.9
Percentage digested.....	40.45	63.93	61.12	61.17	68.45	29.53
Sheep No. 4—						
Fed 4000 gms.....	240.8	82.4	1096.8	1852.8	419.6	288.0
Residue 2 gms. No. 7991-2.....	.1	.4	.5	.9	.2	.1
Eaten.....	240.7	82.0	1096.3	1851.9	419.4	287.9
Excreted 1571 gms. No. 8012.....	154.1	33.3	402.3	652.0	119.1	209.2
Digested.....	86.6	48.7	694.0	1199.0	300.3	78.7
Percentage digested from sorghum hay.....	35.98	60.12	63.30	64.74	71.58	27.34
Average percentage sorghum hay digested.....	38.22	62.03	62.21	62.96	70.02	28.44
Digestion Period No. 44 With Moth Bean.						
Sheep No. 1—						
Fed 3000 gms. No. 8002-3.....	443.7	43.8	759.0	1028.1	414.6	311.4
Residue 154 gms. No. 8009.....	16.2	1.7	18.2	26.2	9.7	81.9
Eaten.....	427.5	42.1	740.8	1001.9	404.9	229.5
Excreted 1174 gms. No. 8013.....	142.1	36.5	334.6	342.1	101.9	216.8
Digested.....	285.4	5.6	406.2	659.8	303.0	12.7
Percentage digested.....	66.76	13.30	54.83	65.85	74.83	5.53
Sheep No. 2—						
Fed 3000 gms.....	443.7	43.8	759.0	1028.1	414.6	311.4
Residue 44 gms. No. 8010.....	3.1	.4	4.6	8.6	4.0	23.3
Eaten.....	440.6	43.4	754.4	1019.5	410.6	288.1
Excreted 1299 gms. No. 8014.....	143.4	40.2	379.6	367.7	100.2	267.9
Digested.....	297.2	3.2	374.8	651.8	310.4	20.2
Percentage digested from moth bean.....	67.43	7.37	49.68	63.93	75.60	7.01
Average percentage moth bean digested.....	67.10	10.84	52.26	64.89	75.21	6.27
Digestion Period No. 45 With <i>Dolichos lablab</i> .						
Sheep No. 1—						
Fed 4000 gms. No. 8108-9.....	592.8	54.4	1344.8	1344.4	394.0	270.0
Residue 311 gms. No. 8121.....	26.7	2.1	147.7	97.5	24.5	22.5
Eaten.....	566.1	52.3	1197.1	1246.9	369.5	247.5
Excreted 1408 gms. No. 8123.....	156.0	25.6	513.8	424.5	108.6	179.5
Digested.....	410.1	26.7	683.3	822.4	260.9	68.0
Percentage digested.....	72.44	51.05	57.05	65.96	70.61	27.47

TABLE 8. NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD
—Continued.

	Protein.	Ether extract.	Crude fiber.	Nitro- gen free extract.	Water.	Ash.
Sheep No. 2—						
Fed 4000 gms.	592.8	54.4	1344.8	1344.4	394.0	270.0
Residue 35 gms. No. 8122	2.8	.3	17.2	9.9	2.5	2.3
Eaten	590.0	54.1	1327.6	1334.5	391.5	267.7
Excreted 1633 gms. No. 8124	164.3	25.5	634.1	490.9	118.9	199.4
Digested	425.7	28.6	693.5	843.6	272.6	68.3
Percentage digested from <i>Dolichos</i> <i>lablab</i>	72.15	52.87	52.24	63.21	69.63	25.51
Average percentage <i>Dolichos lablab</i> digested	72.30	51.96	54.65	64.59	70.12	26.49
Digestion Period No. 46 With Sheep No. 4—						
Fed 900 gms. No. 8168-9	180.9	42.3	667.8	1224.9	6718.5	166.5
Residue 5 gms. No. 8168-9 .....	.1	.0	.4	.7	3.7	.1
Eaten	180.8	42.3	667.4	1224.2	6714.8	166.4
Excreted 692 gms. No. 8170	73.8	12.8	168.9	290.4	52.5	93.6
Digested	107.0	29.5	498.5	933.8	6662.3	72.8
Percentage digested	59.18	69.74	74.69	76.28	99.22	43.75
Digestion Period No. 47 With Sorghum Silage. Sheep No. 3—						
Fed 9000 gms. No. 8223-4	177.3	76.5	617.4	1779.3	.....	191.7
Residue 3 gms. No. 8223-4 .....	.1	.0	.2	.6	.....	.1
Eaten	177.2	76.5	617.2	1778.7	.....	191.6
Excreted 1210 gms. No. 8225	131.3	26.6	271.8	538.3	.....	153.9
Digested	45.9	49.9	345.4	1240.4	.....	37.7
Percentage digested	25.90	65.23	55.93	69.68	.....	19.68
Sheep No. 4—						
Fed 9000 gms.	177.3	76.5	617.4	1779.3	.....	191.7
Residue 11 gms. No. 8223-4 .....	.2	.1	.8	2.2	.....	.2
Eaten	177.1	76.4	616.6	1777.1	.....	191.5
Excreted 1326 gms. No. 8226	141.5	30.6	265.6	635.7	.....	166.7
Digested	35.6	45.8	351.0	1141.4	.....	24.8
Percentage digested from sorghum silage	20.10	59.95	56.93	64.17	.....	12.95
Average percentage sorghum silage digested	23.00	62.59	56.43	66.93	.....	16.32
Digestion Period No. 48 With Alfalfa Hay. Sheep No. 5—						
Fed 3000 gms. No. 8227-8	360.6	42.3	955.5	1175.1	241.8	224.7
Residue 6 gms. No. 8227-8 .....	.7	.1	1.9	2.4	.5	.4
Eaten	359.9	42.2	953.6	1172.7	241.3	224.3
Excreted 1213 gms. No. 8249	110.1	35.5	542.8	310.0	106.4	108.1
Digested	249.8	6.7	410.8	862.7	134.9	116.2
Percentage digested	69.41	15.88	43.08	73.56	55.91	51.81
Sheep No. 6—						
Fed 3000 gms.	360.6	42.3	955.5	1175.1	241.8	224.7
Residue 4 gms. No. 8227-8 .....	.5	.1	1.3	1.6	.3	.3
Eaten	360.1	42.2	954.2	1173.5	241.5	224.4
Excreted 1271 gms. No. 8250	122.7	36.7	565.6	343.5	97.6	105.0
Digested	237.4	5.5	388.6	830.0	143.9	119.4
Percentage digested from alfalfa hay	65.93	13.03	40.73	70.73	59.59	53.21
Average percentage alfalfa hay digested	67.67	14.46	41.91	72.15	57.75	52.51

TABLE 8. NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD
—Continued.

	Protein.	Ether extract.	Crude fibre.	Nitro- gen free extract.	Water.	Ash.
Digestion Period No. 49 With Alfalfa and Rough Rice.						
Sheep No. 5—						
Fed 1800 gms. alfalfa No. 8227-8 ..	216.4	25.4	573.3	705.1	145.1	134.8
1800 gms. rough rice No. 8245-6	156.2	28.4	152.8	1209.8	179.8	73.3
Total fed 3600 gms.	372.6	53.8	726.1	1914.9	324.9	208.1
Residue 1 gm. No. 8227-8. ....	.1	.0	.3	.4	.1	.1
Eaten.	372.5	53.8	725.8	1914.5	324.8	208.0
Excreted 1197 gms. No. 8271.	99.0	27.4	501.3	335.4	85.9	147.8
Digested.	273.5	26.4	224.5	1579.1	238.9	60.2
Digested from alfalfa.	144.9	4.5	213.1	491.1	83.0	60.7
Digested from rough rice.	128.6	21.9	11.4	1088.0	155.9	.....
Percentage digested from rough rice	82.33	77.12	7.46	89.94	86.71	.....
Sheep No. 6—						
Fed 3600 gms.	372.6	53.8	726.1	1914.9	324.9	208.1
Residue 1 gm. No. 8227-8. ....	.1	.0	.3	.4	.1	.1
Eaten.	372.5	53.8	725.8	1914.5	324.8	208.0
Excreted 1126 gms. No. 8272.	99.1	22.9	468.9	311.8	88.7	134.7
Digested.	273.4	30.9	256.9	1602.7	236.1	73.3
Digested from alfalfa.	144.9	4.5	213.1	491.1	83.0	60.7
Digested from rough rice.	128.5	26.4	43.8	1111.6	153.1	12.6
Percentage digested from rough rice	82.27	92.96	28.66	91.87	85.15	17.19
Average percentage rough rice digested.	82.30	85.04	18.06	90.91	85.93	.....
Digestion Period No. 50 With Alfalfa and Rough Rice.						
Sheep No. 5—						
Fed 1800 gms. alfalfa No. 8227-8 ..	216.4	25.4	573.3	705.1	145.1	134.8
1800 gms. rough rice No. 8251-2	146.3	18.2	149.8	1207.4	209.2	69.5
Total fed 3600 gms.	362.7	43.6	723.1	1912.5	354.3	204.3
Residue 20 gms. No. 8227-8. ....	.2	.0	.6	.8	.2	.1
Eaten.	362.5	43.6	722.5	1911.7	354.1	204.2
Excreted 1203 gms. No. 8273.	114.3	26.5	499.4	340.0	79.9	143.0
Digested.	248.2	17.1	223.1	1571.7	274.2	61.2
Digested from alfalfa.	144.8	4.5	213.0	490.8	83.0	60.7
Digested from rough rice.	103.4	12.6	10.1	1080.9	191.2	.5
Percentage digested from rough rice	70.54	69.23	67.4	89.47	91.35	.35
Sheep No. 6—						
Fed 3600 gms.	362.7	43.6	723.1	1912.5	354.3	204.3
Residue 1.0 gms No. 8227-8. ....	.1	.0	.3	.4	.1	.1
Eaten.	362.6	43.6	722.8	1912.1	354.2	204.2
Excreted 1156 gms. No. 8274.	117.6	26.4	480.3	322.5	82.0	127.3
Digested.	245.0	17.2	242.5	1589.6	272.2	76.9
Digested from alfalfa.	144.9	4.5	213.1	491.1	83.0	60.7
Digested from rough rice.	100.1	12.7	29.4	1098.5	189.2	16.2
Percentage digested from rough rice.	68.35	69.78	19.61	90.96	90.39	23.31
Average percentage rough rice digested.	69.45	69.51	13.18	90.22	90.87	11.83

TABLE 8. NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD
—Continued.

	Protein.	Ether extract.	Crude fiber.	Nitro- gen free extract.	Water.	Ash.
Digestion Period No. 51 With Alfalfa and Rough Rice.						
Sheep No. 5—						
Fed 1800 gms. alfalfa No. 8227-8	216.4	25.4	573.4	705.1		134.8
1800 gms. rough rice No. 8269-70	145.8	27.2	149.8	1222.0		75.4
Total fed 3600 gms.	362.2	52.6	723.2	1927.1		210.2
Residue 4.0 gms. No. 8227-8.	.5	.1	1.2	1.5		.3
Eaten	361.7	52.5	722.0	1925.6		209.9
Excreted 1229 gms. No. 8291	107.0	29.1	518.9	333.7		144.5
Digested	254.7	23.4	203.1	1591.9		65.4
Digested from alfalfa	144.7	4.5	212.8	490.4		60.6
Digested from rough rice	110.0	18.9	—9.7	1101.5		4.8
Percentage digested from rough rice	75.45	69.49		90.14		6.37
Sheep No. 6—						
Fed 3600 gms.	362.2	52.6	723.2	1927.1		210.2
Residue 1.0 gms. No. 8227-8.	.1	.0	.3	.4		.1
Eaten	362.1	52.6	722.9	1926.7		210.1
Excreted 1157 gms. No. 8292	108.5	26.8	475.2	317.4		137.2
Digested	253.6	25.8	247.7	1609.3		72.9
Digested from alfalfa	144.9	4.5	213.1	491.1		60.7
Digested from rough rice	108.7	21.3	34.6	1118.2		12.2
Percentage digested from rough rice	74.55	78.31	23.10	91.51		16.18
Average percentage rough rice digested.	75.00	73.90		90.83		11.23
Digestion Period No. 52 With Alfalfa and Peanut Hulls.						
Sheep No. 5—						
Fed 1800 gms. alfalfa No. 8227-8	216.4	25.4	573.4	705.1		134.8
1800 gms. peanut hulls No. 8275-6	177.3	66.4	878.4	405.5		116.5
Total fed 3600 gms.	393.7	91.8	1451.8	1110.6		251.3
Residue 6 gms. No. 8227-8.	.7	.1	1.9	2.4		.4
Eaten	393.0	91.7	1449.9	1108.2		250.9
Excreted 1827 gms. No. 8297	134.3	22.1	985.3	361.4		187.1
Digested	258.7	69.6	464.6	746.8		63.8
Digested from alfalfa	144.5	4.5	212.5	489.6		60.5
Digested from peanut hulls	114.2	65.1	252.1	257.2		3.3
Percentage digested	64.41	98.04	28.69	63.51		2.83
Sheep No. 6—						
Total fed 3600 gms.	393.7	91.8	1451.8	1110.6		251.3
Residue 1.0 gms. No. 8227-8.	.1	.0	.3	.4		.1
Eaten	393.6	91.8	1451.5	1110.2		251.2
Excreted 2129 gms. No. 8298	142.4	25.1	1211.4	409.2		178.0
Digested	251.2	66.7	240.1	701.0		73.2
Digested from alfalfa	144.9	4.5	213.1	491.1		60.7
Digested from peanut hulls	106.3	62.2	27.0	209.9		12.5
Percentage digested from peanut hulls.	59.95	93.67	3.07	51.76		10.73
Average percentage peanut hulls digested.	62.18	95.86	16.4	57.64		6.78

TABLE 8. NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD
—Continued.

	Protein.	Ether extract.	Crude fiber.	Nitro- gen free extract.	Water.	Ash.
Digestion Period No. 53 With Alfalfa.						
Sheep No. 5—						
Fed 3000 gms. No. 8227-8.....	360.6	42.3	955.5	1175.1	241.8	224.7
Residue 39 gms. No. 8399.....	3.0	.7	17.2	11.8	3.0	3.2
Eaten.....	357.6	41.6	938.3	1163.3	238.8	221.5
Excreted 1515 gms. No. 8397.....	128.6	33.2	695.2	400.7	110.4	146.8
Digested.....	229.0	8.4	243.1	762.6	128.4	74.7
Percentage digested.....	64.04	20.19	25.91	65.55	53.77	33.72
Sheep No. 6—						
Fed 3000.....	360.6	42.3	955.5	1175.1	241.8	224.7
Residue 1.0 gms. No. 8227-8.....	.1	.0	.3	.4	.1	.1
Eaten.....	360.5	42.3	955.2	1164.7	241.7	224.6
Excreted 1321 gms. No. 8398.....	113.3	33.3	583.1	362.5	97.2	131.6
Digested.....	247.2	9.0	372.1	802.2	144.5	93.0
Percentage digested from alfalfa.....	68.57	21.28	38.99	68.88	59.79	41.41
Average percentage alfalfa digested.....	66.31	20.74	32.45	67.22	56.78	37.57
Average of No. 48 and No. 53.....	66.99	17.60	37.18	69.69	57.27	45.04
Digestion Period No. 54 With Alfalfa Hay, Sheep No. 1—						
Fed 3000 gms. No. 8316-7.....	305.7	43.8	1127.1	1022.7	266.7	234.3
Residue 108 gms. No. 8408.....	11.5	1.7	41.9	35.4	7.2	10.3
Eaten.....	294.2	42.1	1085.2	987.3	259.5	224.0
Excreted 1263 gms. No. 8404.....	102.3	26.4	572.1	356.0	83.2	122.9
Digested.....	191.9	15.7	513.1	631.3	176.3	101.1
Percentage digested.....	65.23	37.29	47.28	63.94	67.94	45.13
Sheep No. 2—						
Fed 3000 gms.....	305.7	43.8	1127.1	1022.7	266.7	234.3
Residue 9 gms. No. 8316-7.....	.9	.1	3.4	3.1	.8	.7
Eaten.....	304.8	43.7	1123.7	1019.6	265.9	233.6
Excreted 1193 gms. No. 8405.....	99.1	21.8	544.1	341.9	78.5	107.5
Digested.....	205.7	21.9	579.6	677.7	187.4	126.1
Percentage digested from alfalfa.....	67.45	50.11	51.58	66.47	70.48	53.98
Average percentage alfalfa digested.....	66.34	43.70	49.43	65.21	69.21	49.56
Digestion Period No. 55 With Alfalfa and Feterita Seed.						
Sheep No. 1—						
Fed 1800 gms. alfalfa No. 8316-7.....	183.4	26.3	676.3	613.6	160.0	140.6
1800 gms. feterita No. 8318-9.....	248.9	52.7	38.7	1258.6	171.2	30.2
Total fed 3600 gms.....	432.3	79.0	715.0	1872.2	331.2	170.8
Residue 3 gms. alfalfa.....	.3	.4	1.1	1.0	.2	.2
Eaten.....	432.0	78.6	713.9	1871.2	331.0	170.6
Excreted 946 gms. No. 8580.....	88.3	26.1	406.9	285.0	61.8	77.9
Digested.....	343.7	52.5	307.0	1586.2	269.2	92.7
Digested from alfalfa.....	122.9	10.8	339.4	403.7	114.1	69.3
Digested from feterita seed.....	220.8	41.7	—32.4	1182.5	155.1	23.4
Percentage digested from feterita seed.....	88.67	76.65	0	93.91	75.33	77.99

TABLE 8. NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD
—Continued.

	Protein.	Ether extract.	Crude fiber.	Nitro- gen free extract.	Water.	Ash
Sheep No. 2—						
Fed 3600 gms.	432.3	79.0	715.0	1872.2	331.2	170.8
Residue 12 gms. No. 8289.	1.2	.2	4.5	4.0	1.0	1.2
Eaten.	431.1	78.8	710.5	1868.2	330.2	169.6
Excreted 749 gms. No. 8581.	81.3	29.6	308.2	216.6	48.2	65.1
Digested.	349.8	49.2	402.3	1651.6	282.0	104.5
Digested from alfalfa.	122.3	11.0	337.7	401.7	114.2	68.8
Digested from feterita seed.	227.5	38.2	64.6	1249.9	167.8	35.7
Percentage digested from feterita seed.	91.40	72.49	100.0	99.39	98.01	100.00
Average percentage feterita seed digested.	90.03	74.52	50.0	96.60	86.67	88.99
Digestion Period No. 56 With Alfalfa and Argentine Corn.						
Sheep No. 1—						
Fed 1800 gms. alfalfa No. 8316-7.	183.4	26.3	676.3	613.6	160.0	140.6
1800 gms. Argentine corn No. 8406-7.	186.5	85.1	35.3	1285.4	181.6	26.3
Total fed 3600 gms.	369.9	111.4	711.6	1899.0	341.6	166.9
Residue 8.5 gms. No. 8316-7. ....	.9	.1	3.2	2.9	.8	.7
Eaten.	369.0	111.3	708.4	1896.1	340.8	166.2
Excreted 852 gms. No. 8593.	91.4	24.0	359.7	247.2	57.6	72.1
Digested.	277.6	87.3	348.7	1648.9	283.2	94.1
Digested from alfalfa.	122.5	10.9	338.4	402.5	114.4	69.1
Digested from Argentine corn.	155.1	76.4	10.3	1246.4	168.8	25.0
Percentage digested from Argentine corn.	83.16	89.78	29.18	96.96	92.95	95.06
Sheep No. 2—						
Fed 3600 gms.	369.9	111.4	711.6	1899.0	341.6	166.9
Residue 5.0 gms. No. 8316-7. ....	.5	.1	1.8	1.7	.4	.4
Eaten.	369.4	111.3	709.8	1897.3	341.2	166.5
Excreted 757 gms. No. 8594.	79.9	22.4	314.5	224.6	45.6	70.0
Digested.	289.5	88.9	395.3	1672.7	295.6	96.5
Digested from alfalfa.	122.7	10.9	339.1	403.2	114.7	69.2
Digested from Argentine corn.	166.8	78.9	56.2	1269.5	180.9	27.3
Percentage digested from Argentine corn.	89.44	92.71	159.21	98.76	99.61	103.80
Average percentage Argentine corn dige fed.	86.30	91.25	94.20	97.20	96.28	99.43
Digestion Period No. 57 With Alfalfa and Milo Maize Head Chops.						
Sheep No. 1—						
Fed 1800 gms. alfalfa No. 8316-7.	183.4	26.3	676.3	613.6	160.0	140.6
1800 gms. milo maize head chops No. 8590-1.	155.2	39.8	132.7	1246.0	165.1	61.7
Total fed.	338.6	66.1	809.0	1859.6	325.1	202.3
Residue 25 gms. No. 8794.	2.3	.3	9.8	8.8	1.8	2.0
Eaten.	336.3	65.8	799.2	1850.8	323.3	200.3
Excreted 862 gms. No. 8792.	89.7	18.0	330.1	284.5	51.8	87.9
Digested.	246.6	47.8	469.1	1566.3	271.5	112.4
Digested from alfalfa.	121.6	10.9	335.1	398.6	113.7	68.4
Digested from milo maize head chops	125.0	36.9	134.0	1167.7	157.8	44.0
Percentage digested from milo maize head chops.	80.5	92.7	101.0	93.7	95.6	71.3

TABLE 8. NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD
[—Continued.]

	Protein.	Ether extract.	Crude fiber.	Nitro- gen free extract.	Water.	Ash.
Sheep No. 2—						
Fed 3600 gms.	338.6	66.1	809.0	1859.6	325.1	202.3
Residue 8 gms. No. 8316-7 . . . . .	.8	.1	3.0	2.7	.7	.6
Eaten	337.8	66.0	806.0	1856.9	324.4	201.7
Excreted 963 gms. No. 8793	93.8	21.5	377.6	302.5	67.2	100.4
Digested	244.0	44.5	428.4	1554.4	257.2	101.3
Digested from alfalfa	122.5	10.9	338.5	402.6	114.5	69.1
Digested from milo maize head chops	121.5	33.6	89.9	1151.8	142.7	32.2
Percentage digested from milo maize head chops	78.29	84.43	67.75	92.44	86.43	52.19
Average percentage milo maize head chops digested	79.4	88.6	84.4	93.1	91.0	61.7
Digestion Period No. 58 With Alfalfa Hay.						
Sheep No. 1—						
Fed 3000 gms. No. 8316-6	305.7	43.8	1127.1	1022.7	266.7	234.3
Residue 16 gms. No. 8797	2.1	.2	6.0	4.4	1.3	2.0
Eaten	303.6	43.6	1121.1	1018.3	265.4	232.3
Excreted 1203 gms. No. 8795	98.5	26.9	551.2	350.2	66.6	109.5
Digested	205.1	16.7	569.9	668.1	198.8	122.8
Percentage digested	67.56	38.30	50.83	65.61	74.91	52.86
Sheep No. 2—						
Fed 300 gms.	305.7	43.8	1157.1	1022.7	266.7	234.3
Residue 11.0 gms. No. 8798	1.5	.1	4.2	3.3	.9	1.0
Eaten	304.2	43.7	1122.9	1019.4	265.8	233.3
Excreted 1195 gms. No. 8796	96.8	25.7	545.9	330.4	69.0	127.3
Digested	207.4	18.0	577.0	689.0	196.8	106.0
Percentage digested from alfalfa hay	68.18	41.19	51.38	67.59	74.04	45.44
Average percentage alfalfa hay digested	67.87	39.75	51.11	66.60	74.48	49.15
Average percentage digested No. 54 & 58	67.11	41.73	50.27	65.90	71.85	49.36
Digestion Period No. 59 With Alfalfa and Jack Bean.						
Sheep No. 2—						
Fed 1800 gms. alfalfa No. 8316-7	183.4	26.3	676.3	613.6	160.0	140.6
1800 gms. jack beans No. 8742-3	489.2	51.7	146.5	889.4	172.1	51.5
Total fed	672.6	78.0	822.8	1503.0	332.1	192.1
Residue 13 gms. No. 8824	2.4	.2	3.5	4.7	1.4	.8
46 gms. No. 8823	12.3	1.1	4.1	22.7	4.3	1.4
Eaten	657.9	76.7	815.2	1475.6	326.4	189.9
Excreted 874 gms. No. 8822	109.3	24.5	362.8	235.5	66.0	76.0
Digested	548.6	52.2	452.4	1240.1	260.4	113.9
Digested from alfalfa	121.5	10.9	338.2	401.3	114.0	69.0
Digested from jack beans	427.1	41.3	114.2	838.8	146.4	44.9
Percentage digested from jack beans	89.6	81.6	80.2	96.8	87.2	89.6
Digestion Period No. 60 With Sudan Hay						
Sheep No. 1—						
Fed 4000 gms. No. 9290-1	430.0	69.2	1239.6	1529.2	377.6	354.8
Residue 49 gms. No. 9344	5.8	.8	13.8	17.5	3.5	7.6
Eaten	424.2	68.4	1225.8	1511.7	374.1	347.2
Excreted 1939 gms. No. 9342	175.7	36.5	486.5	834.7	155.7	249.9
Digested	248.5	31.9	739.3	677.0	218.4	97.3
Percentage digested	58.58	46.64	60.31	44.78	58.38	28.02

TABLE 8. NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD
—Continued.

	Protein.	Ether extract.	Crude fibre.	Nitro- gen free extract.	Water.	Ash.
Sheep No. 2—						
Fed 4000 gms.	430.0	69.2	1239.6	1529.2	374.6	354.8
Residue 15.5 gms. No. 9345	13.2	2.1	56.9	56.2	10.3	16.3
Eaten.....	416.8	67.1	1182.7	1473.0	367.3	338.5
Excreted 2052 gms. No. 9343	175.4	37.8	510.9	902.1	151.6	274.1
Digested.....	241.4	29.3	671.8	570.9	215.7	64.4
Percentage digested from sudan hay	57.92	43.67	56.80	38.76	58.72	19.02
Average percentage sudan hay digested.....	58.25	45.15	58.56	41.77	58.55	23.52
Digestion Period No. 61 With Prairie Hay						
Sheep No. 1—						
Fed 4000 gms. No. 9337-8	199.6	80.4	1288.4	1807.6	346.4	278.4
Residue 136 gms. No. 9374	4.6	1.5	52.9	49.4	10.1	17.6
Eaten.....	195.0	78.9	1235.5	1758.2	336.3	260.8
Excreted 2041 gms. No. 9371	145.9	60.0	561.7	874.4	146.5	252.5
Digested.....	49.1	18.9	673.8	883.8	189.8	8.3
Percentage digested.....	25.18	23.95	54.54	50.27	56.44	3.18
Sheep No. 2—						
Fed 4000 gms.	199.6	80.4	1288.4	1807.6	346.4	278.4
Residue 105.5 gms. No. 9375	3.9	1.5	44.4	38.2	7.7	9.9
Eaten.....	195.7	78.9	1244.0	1769.4	338.7	268.5
Excreted 2097 gms. No. 9372	145.7	39.6	593.2	912.6	152.9	252.9
Digested.....	50.0	39.3	650.8	856.8	185.8	15.6
Percentage digested from prairie hay	25.55	49.81	52.32	48.42	54.86	5.81
Average percentage prairie hay digested.....	25.37	36.88	53.43	49.34	55.65	4.50
Digestion Period No. 62 With Sudan Hay.						
Sheep No. 1—						
Fed 4000 gms. No. 9408-9	452.0	86.8	1117.6	1623.6	347.6	372.4
Residue 17 gms. No. 9529	2.0	.3	3.1	5.5	.6	5.4
Eaten.....	450.0	86.5	1114.5	1618.1	347.0	367.0
Excreted 1828 gms. No. 9531	175.3	34.4	442.4	763.6	95.4	317.0
Digested.....	274.7	52.1	672.1	854.5	241.6	50.0
Percentage digested.....	61.04	60.23	60.21	52.80	69.62	13.62
Sheep No. 2—						
Fed 4000 gms.	452.0	86.8	1117.6	1623.6	347.6	372.4
Residue 13 gms. No. 9530	1.6	.2	3.7	5.1	.7	1.7
Eaten.....	450.4	86.6	1113.9	1618.5	346.9	370.7
Excreted 1799 gms. No. 9532	147.3	32.9	442.7	770.3	95.7	310.0
Digested.....	303.1	53.7	671.2	848.2	251.2	60.7
Percentage digested from sudan hay	67.29	62.01	60.26	52.41	72.41	16.38
Average percentage sudan hay digested.....	64.17	61.16	60.24	52.61	71.02	15.00
Digestion Period No. 63 With Alfalfa Hay.						
Sheep No. 1—						
Fed 3000 gms. No. 9537-8	369.6	43.8	1170.0	1055.4	156.6	233.2
Residue 3 gms. No. ....	.4	.....	1.2	1.0	.2	.5
Eaten.....	369.2	43.8	1168.8	1054.4	156.4	232.7
Excreted 1142 gms. No. 9676	110.1	31.1	532.5	306.4	63.5	98.4
Digested.....	259.1	12.7	636.3	748.0	92.9	134.3
Percentage digested from alfalfa hay	71.83	29.00	54.44	70.94	59.38	57.62

TABLE 8. NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD
 —Continued.

	Protein.	Ether extract.	Crude fiber.	Nitro- gen free extract.	Water.	Ash.
Sheep No. 2—						
Fed 3000 gms.	369.6	43.8	1170.0	1055.4	156.6	233.2
Residue 4 gms. No. ....	.5	.1	1.5	1.4	.3	.3
Eaten.....	369.1	43.7	1168.5	1054.0	156.3	232.9
Excreted 1194 gms. No. 9677.....	112.1	32.2	560.7	309.6	69.0	110.3
Digested.....	257.0	11.5	607.8	744.4	87.3	122.6
Percentage digested from alfalfa hay	69.62	26.31	52.04	70.63	55.85	52.60
Average percentage alfalfa hay digested.....	70.72	27.66	53.24	70.79	57.82	55.11
Digestion Period No. 64 With Alfalfa and Wheat Shorts						
Sheep No. 1—						
Fed 1800 gms. alfalfa No. 9537-8 ..	221.8	26.3	664.2	633.2	115.2	139.5
1800 gms. wheat shorts No. 9629-30.....	288.2	45.4	19.8	1251.7	177.7	17.5
Total fed.....	510.0	71.7	684.0	1884.9	292.9	157.0
Residue 14 gms. No. 9728.....	2.2	.2	1.3	8.8	.7	.7
Eaten.....	507.8	71.5	682.7	1876.1	292.2	156.3
Excreted 824 gms. No. 9730.....	102.3	29.4	336.8	226.4	44.8	84.0
Digested.....	405.5	42.1	345.9	1649.7	247.4	72.3
Digested from alfalfa.....	152.0	5.0	353.9	438.1	66.5	76.0
Digested from wheat shorts.....	253.5	37.1	0	1211.6	180.9	—3.7
Percentage digested from wheat shorts.....	88.0	81.7	0	96.8	101.8	0
Sheep No. 2—						
Fed 3600.....	510.0	71.7	684.0	1884.9	292.9	157.0
Residue 12.0 gms. No. 9729.....	1.9	.2	1.0	7.5	.7	.7
Eaten.....	508.1	71.5	682.0	1877.4	292.2	156.3
Excreted 670 gms. No. 9731.....	78.7	24.9	277.6	183.8	37.4	67.5
Digested.....	429.4	46.6	404.4	1693.6	254.8	88.8
Digested from alfalfa.....	152.2	5.0	354.1	439.0	66.5	76.0
Digested from wheat shorts.....	277.2	41.6	50.3	1254.6	188.3	12.8
Percentage digested from wheat shorts.....	96.2	91.6	100.0	100.2	106.0	71.04
Average percentage wheat shorts digested.....	92.1	86.7	50.0	98.5	103.9	35.52
Digestion Period No. 65 With Alfalfa and Cottonseed.						
Sheep No. 1—						
Fed 1800 gms. alfalfa No. 9537-8 ..	221.8	26.3	664.2	633.2	115.2	139.5
843 gms. hulls No. 9726-7.....	34.4	4.6	437.3	276.4	64.9	25.5
957 gms. kernels No. 9688-9.....	391.6	302.3	22.6	150.4	42.3	42.9
Total fed.....	647.8	333.2	1124.1	1060.0	227.4	207.9
Residue 3 gms. No. 9739.....	.6	.1	.....	.....	.2	.4
Eaten.....	647.2	333.1	1124.1	1060.0	227.2	207.0
Excreted 1211 gms. No. 9738.....	160.8	32.9	525.6	326.1	76.5	89.1
Digested.....	486.4	300.2	598.5	733.9	150.7	118.4
Digested from alfalfa.....	153.1	5.0	354.6	444.3	66.8	76.0
Digested from cottonseed.....	333.3	295.2	243.9	289.6	83.9	42.4
Percentage digested from cottonseed	78.2	96.2	53.0	67.9	74.8	62.33

TABLE 8.—NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD
—Continued.

	Protein.	Ether extract.	Crude fiber.	Nitro- gen-free extract	Water.	Ash.
Sheep No. 2—						
Fed.....	647.8	333.2	1124.1	1060.0	227.4	207.9
Residue 2 gms. No. 9740.....	.3	.0	.....	.....	.1	.4
Eaten.....	647.5	333.2	1124.1	1060.0	227.3	207.5
Excreted 1212 gms. No. 9741.....	150.5	32.6	531.0	324.6	78.8	94.5
Digested.....	497.0	300.6	593.1	735.4	148.5	113.0
Digested from alfalfa.....	153.3	5.0	354.6	444.3	66.8	76.0
Digested from cottonseed.....	343.7	295.6	238.5	291.1	81.7	37.0
Percentage digested from cotton- seed.....	80.7	96.3	51.9	68.2	72.8	54.39
Average percentage cottonseed digested.....	79.45	96.25	52.45	68.05	73.80	58.36
Digestion Period No. 66 With Alfalfa and Milo Maize Head Chops.						
Sheep No. 1—						
Fed 1800 gms. alfalfa No. 9537-8....	221.8	26.3	664.2	633.2	115.2	139.5
1800 gms. maize head chops No. 9733-4.....	178.9	49.1	124.4	1219.9	172.8	55.1
Total fed.....	400.7	75.4	788.6	1853.1	288.0	194.6
Excreted 1040 gms. No. 9763.....	118.7	28.6	410.4	323.6	62.2	96.5
Digested.....	282.0	46.8	378.2	1529.5	225.8	98.1
Digested from 1800 gms. alfalfa.....	153.5	5.0	354.6	444.3	66.9	76.0
Digested from milo maize head chops	128.5	41.8	23.61	1085.2	158.9	22.1
Percentage digested from maize head chops.....	71.8	85.1	19.0	89.0	92.0	40.18
Sheep No. 2—						
Fed.....	400.7	75.4	788.6	1853.1	288.0	194.6
Excreted 1053 gms. No. 9764.....	119.0	28.9	410.6	334.7	61.7	98.1
Digested.....	281.7	46.5	378.0	1518.4	226.3	95.5
Digested from 1800 gms alfalfa.....	153.5	5.0	354.6	444.3	66.9	76.0
Digested from maize head chops....	128.2	41.5	23.4	1074.1	159.4	19.5
Percentage digested from maize head chops.....	71.7	84.5	18.8	88.0	92.2	35.45
Average percentage maize head chop dige ted.....	71.8	84.8	18.9	88.5	92.1	37.81
Digestion Period No. 67 With Alfalfa and Peat.						
Sheep No. 1—						
Fed 1800 gms. alfalfa No. 9537-8....	221.8	26.3	664.2	633.2	115.2	139.5
1800 gms. peat No. 9748-9.....	308.2	14.9	180.2	628.2	181.6	486.9
Total fed.....	530.0	41.2	844.4	1261.4	296.8	626.4
Residue 1085 gms. Mo. 9771 (practi- cally all peat).....	190.3	5.3	113.3	410.2	72.3	293.6
Peat assumed eaten.....	117.9	9.6	66.9	218.0	109.3	193.3
Eaten.....	339.7	35.9	731.1	851.2	224.5	332.8
Excreted 1464 gms. No. 9773.....	206.0	19.5	436.3	472.9	88.6	240.8
Digested.....	133.7	16.4	294.8	378.3	135.9	92.0
Digested from alfalfa.....	153.5	5.0	354.6	444.3	66.9	76.0
Digested from peat.....	.0	11.4	0	0	69.0	16.0
Percentage digested from peat.....		100.0			63.1	3.28

TABLE 8. NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD
—Continued.

	Protein.	Ether extract.	Crude fiber	Nitro- gen free extract.	Water.	Ash.
Sheep No. 2—						
Fed.....	530.0	41.2	844.4	1261.4	296.8	626.4
Residue 1281 gms. No. 9772 (practically all peat).....	228.1	7.0	117.7	503.8	88.5	335.8
Peat assumed eaten.....	80.1	7.9	62.5	124.4	93.1	151.1
Eaten.....	301.9	34.2	626.7	757.6	208.3	290.6
Excreted 1319 gms. No. 9774.....	176.4	19.5	403.1	429.8	63.6	226.7
Digested.....	125.5	14.7	223.6	327.8	144.7	63.9
Digested from alfalfa.....	153.5	5.0	354.6	444.3	66.9	76.0
Digested from peat.....	0.	9.7	0.	0.	77.8	0.
Percentage digested from peat.....		100.			83.6	0.
Average percentage peat digested.....		100.			73.4	1.64
Digestion Period No. 68 With Alfalfa Hay.						
Sheep No. 1—						
Fed 3000 gms. No. 9537-3.....	369.6	43.8	1170.0	1055.4	156.6	233.2
Residue 3 gms.....	.4	.0	1.1	1.1	.2	.2
Eaten.....	369.2	43.8	1168.9	1054.3	156.4	233.0
Excreted 1168 gms. No. 9811.....	115.5	37.5	528.2	317.6	68.9	101.1
Digested.....	253.7	6.3	640.7	746.7	87.5	131.9
Percentage digested.....	68.70	14.38	56.52	70.82	55.94	56.60
Sheep No. 2—						
Eaten.....	369.2	43.8	1168.9	1054.3	156.4	233.2
Excreted 1265 gms. No. 9812.....	123.0	36.8	577.9	334.7	61.0	119.0
Digested.....	246.2	7.0	591.0	719.6	95.4	114.2
Percentage digested from alfalfa hay.....	66.67	15.98	50.56	68.26	60.98	49.00
Average percentage alfalfa hay digested.....	67.69	15.18	53.54	69.54	58.46	52.80
Average percentage alfalfa hay. D. E. 63 and 68.....	69.21	21.42	53.39	70.16	58.04	53.95
Digestion Period No. 69 With Peanut Hay.						
Sheep No. 3—						
Fed 4000 gms. peanut hay No. 9814-5.....	404.4	145.2	933.2	1777.6	284.0	454.4
Residue 35 gms. No. 9958.....	0.7	0.2	1.6	2.1	0.3	30.0
Eaten.....	403.7	145.0	931.6	1775.5	283.7	424.4
Excreted 1579 gms. No. 9956.....	141.6	40.6	509.1	401.4	97.3	389.1
Digested.....	262.1	104.4	422.5	1374.1	186.4	35.3
Percentage digested.....	64.92	71.99	45.33	77.39	65.96	8.31
Sheep No. 6—						
Fed 4000 gms.....	403.7	145.0	931.6	1775.6	283.7	454.4
Eaten.....	135.5	42.6	503.6	421.4	95.4	428.4
Excreted 1677 gms. No. 9957.....						
Digested.....	268.2	102.4	428.0	1354.1	188.3	26.0
Percentage digested from peanut hay.....	66.43	70.61	45.92	76.26	66.36	5.7
Average percentage peanut hay digested.....	65.68	71.30	45.62	76.82	66.16	.....
Digestion Period No. 70 With Kafir Stalk and Heads.						
Sheep No. 2—						
Fed 3408 gms. stalk No. 9952-1.....	239.6	55.6	873.5	1521.7	427.4	290.7
592 gms. head No. 9949-50.....	54.9	7.9	127.6	296.8	79.3	25.6
Total fed.....	294.5	63.5	1001.1	1818.5	506.7	316.3
Eaten.....	294.5	63.5	1001.1	1818.5	506.7	316.3
Excreted 1192 gms. No. 10140.....	110.6	26.2	291.3	510.2	72.1	181.5
Digested.....	183.9	37.3	709.8	1308.3	434.6	134.8
Percentage digested.....	62.45	58.75	70.91	71.94	85.79	42.62

TABLE 8. NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD
—Continued.

	Protein.	Ether extract.	Crude fiber.	Nitro- gen free extract.	Water.	Ash.
Sheep No. 3—						
Fed.....	294.5	63.5	1001.1	1818.5	506.7	316.3
Residue 30 gms. No. 10139.....	1.5	.5	11.0	12.9	1.9	2.2
Eaten.....	293.0	63.0	990.1	1805.6	504.8	314.1
Excreted 1353 gms. No. 10141.....	110.4	29.0	329.3	582.6	87.4	214.3
Digested.....	182.6	34.0	660.8	1223.0	417.4	99.8
Percentage digested.....	62.32	53.96	66.74	67.73	82.69	31.78
Average percentage digested.....	62.39	56.36	68.83	69.84	84.24	37.20
Digestion Period No. 71 With Milo Stalk and Heads.						
Sheep No. 2—						
Fed 2464 gms. stalk No. 10044-5....	72.4	33.0	788.8	1108.6	207.0	256.3
1536 gms. head No. 10042-3....	127.8	35.9	113.2	1043.9	164.2	51.0
Total fed.....	200.2	68.9	900.0	2152.5	371.2	307.3
Eaten.....	200.2	68.9	900.0	2152.5	371.2	307.3
Excreted 1091 gms. No. 10185.....	131.7	20.1	243.0	485.7	66.1	144.4
Digested.....	68.5	48.8	657.0	1666.8	305.1	162.9
Percentage digested.....	34.22	70.81	73.00	77.43	82.19	53.01
Sheep No. 3—						
Fed.....	200.2	68.9	900.0	2152.5	371.2	307.3
Residue 115 gms. No. 10187.....	2.4	1.3	42.7	44.9	11.9	11.8
Eaten.....	197.8	67.6	857.3	2107.6	359.3	295.5
Excreted 1125 gms No. 10186.....	114.9	19.6	249.2	523.4	71.0	147.0
Digested.....	82.9	48.0	608.1	1584.2	288.3	148.5
Percentage digested from milo stalks and heads.....	41.90	70.99	70.90	78.91	80.24	50.25
Average percentage milo stalks and heads digested.....	38.07	70.90	71.95	78.17	81.22	51.63
Digestion Period No. 72 With Bermuda Hay.						
Sheep No. 1—						
Fed 4200 gms. No. 10981-2.....	252.0	68.5	1129.8	2084.0	324.7	341.4
Residue 81.8 gms. No. 11105.....	4.9	1.0	27.5	30.0	6.8	11.6
Eaten.....	247.1	67.5	1102.3	2054.0	317.9	329.8
Excreted 1863.5 gms. No. 11103.....	131.2	29.4	486.9	858.7	121.9	235.4
Digested.....	115.9	38.1	615.4	1195.3	196.0	94.4
Percentage digested.....	46.90	56.45	55.82	58.19	61.65	28.62
Sheep No. 2—						
Fed 4200 gms.....	252.0	68.5	1129.8	2084.0	324.7	341.4
Residue 11.8 gms. No. 11104.....	.8	.2	3.6	4.6	.9	1.8
Eaten.....	251.2	68.3	1126.2	2079.4	323.8	339.6
Excreted 1997.8 gms. No. 11102.....	130.5	30.6	541.0	919.0	134.9	241.9
Digested.....	120.7	37.7	585.2	1160.4	188.9	97.7
Percentage digested from bermuda hay.....	48.05	55.20	51.95	55.80	58.34	28.77
Average percentage bermuda hay digested.....	47.47	55.82	53.88	57.00	60.00	28.70
Digestion Period No. 73 With Sudan Grass.						
Sheep No. 1—						
Fed 4200 gms. No. 10987-8.....	328.4	79.4	1265.9	1808.1	374.6	343.6
Residue 102 gms. No. 11123.....	5.6	1.3	36.6	42.4	8.2	7.4
Eaten.....	322.8	78.1	1229.3	1765.7	366.4	336.2
Excreted 1765.5 gms. No. 11133.....	135.9	28.8	483.7	742.9	142.1	232.0
Digested.....	186.9	49.3	745.6	1022.8	224.3	104.2
Percentage digested.....	57.90	63.12	60.64	57.93	61.22	31.01

TABLE 8. NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD
—Continued.

	Protein.	Ether extract.	Crude fiber.	Nitro- gen free extract.	Water.	Ash.
Sheep No. 2—						
Fed.....	328.4	79.4	1265.9	1808.1	374.6	343.6
Residue 6 gms.....	.5	.1	1.8	2.6	.5	.5
Eaten.....	327.9	79.3	1264.1	1805.5	374.1	343.1
Excreted 1681.2 gms. No. 11134.....	142.2	32.4	442.8	698.4	136.8	228.5
Digested.....	185.7	46.9	821.3	1107.1	237.3	114.6
Percentage digested from sudan grass.....	56.63	59.14	64.97	61.32	63.43	33.40
Average percentage sudan grass digested.....	57.27	61.13	62.81	59.63	62.33	32.21
Digestion Period No. 74 With Feterita Forage Sheep No. 1—						
Fed 4200 gms. No. 11127-8.....	216.7	70.6	1226.8	1759.4	575.8	350.7
Residue 505 gms. No. 11136.....	13.9	7.5	175.0	244.5	34.9	29.2
Eaten.....	202.8	63.1	1051.8	1514.9	540.9	321.5
Excreted 1390.9 gms. No. 11142.....	103.5	23.6	369.3	598.4	82.5	213.6
Digested.....	99.3	39.5	682.5	916.5	458.4	107.9
Percentage digested.....	48.96	62.60	64.88	60.50	84.75	33.56
Sheep No. 2—						
Fed 4200 gms.....	216.7	70.6	1226.8	1759.4	575.8	350.7
Residue 681 gms. No. 11137.....	16.0	11.2	229.3	321.0	63.3	40.1
Eaten.....	200.7	59.4	997.5	1438.4	512.5	310.6
Excreted 1298.5 gms. No. 11143.....	97.9	26.9	321.9	555.6	90.6	223.3
Digested.....	102.8	32.5	675.6	882.8	421.9	87.3
Percentage digested from feterita forage.....	51.22	54.71	67.73	61.37	82.32	24.90
Average percentage feterita forage digested.....	50.09	58.66	66.31	60.94	83.54	29.23
Digestion Period No. 75 With Shallu Forage. Sheep No. 2—						
Fed 4200 gms. No. 11138-9.....	117.2	56.7	1488.5	1913.9	293.2	330.5
Residue 747 gms. No. 11210.....	11.7	6.9	291.9	322.9	63.8	49.9
Eaten.....	105.5	49.8	1196.6	1591.0	229.4	280.6
Excreted 1762.6 gms. No. 11209.....	114.6	33.7	422.1	789.5	116.5	286.2
Digested.....		16.1	774.5	801.5	112.9	
Percentage digested from shallu forage.....	0	32.33	64.73	50.38	49.21	
Digestion Period No. 76 With Peanut Hay. Sheep No. 1—						
Fed 4200 gms. No. 11212-3.....	396.1	127.3	1170.5	1850.1	352.0	304.1
Residue 0 gms.....						
Eaten.....	396.1	127.3	1170.5	1850.1	352.0	304.1
Excreted 1584.4 gms. No. 11242.....	142.8	44.9	612.4	445.8	122.2	218.4
Digested.....	253.3	82.4	558.1	1404.3	229.8	85.7
Percentage digested from peanut hay.....	63.9	64.7	47.7	75.9	65.3	28.2

TABLE 8. NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD
—Continued.

	Protein.	Ether extract.	Crude fibre.	Nitro- gen free extract.	Water.	Ash.
Sheep No. 2—						
Fed 4200 gms.	396.1	127.3	1170.5	1850.1	352.0	304.1
Residue 11.1 gms.	1.0	.3	3.1	4.9	.9	.8
Eaten.	395.1	127.0	1167.4	1845.2	351.1	303.3
Excreted 1554.6 gms. No. 11243.	145.4	34.0	593.2	460.9	115.2	205.8
Digested.	249.7	93.0	574.2	1384.3	235.9	97.5
Percentage digested from peanut hay	63.2	73.2	49.2	75.0	67.2	32.1
Average percentage peanut hay digested.	63.6	69.0	48.5	75.5	66.3	30.2
Digestion Period No. 77 With Peanut Hay, Peanuts and Peanut Hulls.						
Sheep No. 1—						
Fed 2310 gms peanut hay No. 11232-5.	224.1	76.5	632.7	975.1	200.3	201.4
1400 gms. peanuts No. 11234-7	398.3	657.0	56.0	186.9	67.6	34.2
490 gms. peanut hulls No. 11233-6.	31.1	7.4	286.8	71.0	35.2	58.5
Total fed 4200 gms.	653.5	740.9	975.5	1233.0	303.1	294.1
Residue 437.8 gms. No. 11261.	93.3	130.6	89.6	72.0	24.6	26.8
Eaten.	560.2	610.3	885.9	1160.1	278.5	267.3
Excreted 1356.6 gms. No. 11281.	118.3	32.2	432.1	444.2	83.2	246.8
Digested.	441.9	588.1	453.8	715.9	195.3	20.5
Digested from peanut hay, estimated	83.2	48.3	263.4	681.2	116.5	52.7
Digested from peanuts.	338.7	539.8	190.4	34.7	78.8	0.
Percentage digested from peanut hay and whole peanuts.	78.9	96.4	51.2	61.7	70.1	7.7
Percentage digested from whole peanuts.	83.61	80.97	55.41	13.45	76.50	0
Sheep No. 2—						
Fed 4200 gms.	653.5	740.9	975.5	1233.0	303.1	294.1
Residue 0 gms.	0.0	0.0	0.0	0.0	0.0	0.0
Eaten.	653.5	740.9	975.5	1233.0	303.1	294.1
Excreted 1726.4 gms. No. 11282.	159.7	43.9	590.9	586.1	101.3	244.5
Digested.	493.8	697.0	384.6	646.9	201.8	49.6
Digested from peanut hay.	142.53	52.79	306.86	736.20	132.8	60.82
Digested from peanuts.	351.27	644.21	77.74	—89.30	69.00	—11.22
Percentage digested from peanut hay and whole peanuts.	75.6	94.1	39.4	52.5	66.6	16.9
Percentage digested from whole peanuts.	81.88	97.01	22.66	0	66.99	0
Average percentage peanut hay and whole peanuts digested.	77.3	95.3	45.3	57.1	68.4	12.3
Average percentage whole peanuts digested.	82.75	88.99	39.04	6.72	71.74	0
Digestion Period No. 78 With Rice Hay.						
Sheep No. 1—						
Fed 4200 gms. No. 11259-60.	237.7	57.5	1301.6	1676.2	291.9	635.0
Residue 1948.3 gms. No. 11301.	95.7	24.7	635.5	761.0	142.6	288.7
Eaten.	142.0	32.8	666.1	915.2	149.3	346.3
Excreted 1459.7 gms. No. 11308.	94.6	15.9	383.8	501.6	94.3	369.6
Digested.	47.4	16.9	282.3	413.6	55.0	0
Percentage digested from rice hay.	33.4	51.5	42.4	45.2	36.8	.....

TABLE 8. NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD
—Continued.

	Protein.	Ether extract.	Crude fiber.	Nitro- gen free extract.	Water.	Ash.
Sheep No. 2—						
Fed 4200 gms. No. 11259-60.....	237.7	57.5	1301.6	1676.2	291.9	635.0
Residue 200.3 gms. No. 11302.....	7.5	1.5	69.8	78.3	14.7	28.5
Eaten.....	230.2	56.0	1231.8	1597.9	277.2	606.5
Excreted 2172.3 gms. No. 11309.....	137.5	22.2	491.6	799.4	139.0	582.6
Digested.....	92.7	33.8	740.2	798.5	138.2	23.9
Percentage digested from rice hay.....	42.1	60.4	60.1	50.0	49.9	3.9
Average percentage rice hay digested.....	37.8	56.0	51.3	47.6	43.4	.....
Digestion Period No. 79 With Dwarf Black Kafir Forage.						
Sheep No. 2—						
Fed 3500 gms. No. 11299-300.....	182.7	68.3	1080.8	1601.3	224.0	343.0
Residue 124.3 gms. No. 11354.....	4.1	2.2	39.6	57.6	8.4	12.4
Eaten.....	178.6	66.1	1041.2	1543.7	215.6	330.6
Excreted 1795.6 gms. No. 11373.....	133.6	34.1	429.9	750.6	109.9	337.6
Digested.....	45.0	32.0	611.3	793.1	105.7	.....
Percentage digested.....	25.2	48.4	58.7	51.4	49.0	.....
Sheep No. 3—						
Fed.....	182.7	68.3	1080.8	1601.3	224.0	343.0
Residue 109.2 gms. No. 11355.....	3.5	1.8	30.4	48.6	7.4	17.4
Eaten.....	179.2	66.5	1050.4	1552.7	216.6	325.6
Excreted 2242.1 gms. No. 11374.....	159.2	35.4	647.3	913.0	149.8	337.4
Digested.....	20.0	31.1	403.1	639.7	66.8	.....
Percentage digested from kafir forage.....	11.2	46.8	38.4	41.2	30.8	.....
Average percentage kafir forage digested.....	18.2	47.6	48.6	46.3	39.9	.....
Digestion Period No. 80 With Standard Milo Maize Forage.						
Sheep No. 1—						
Fed 3150 gms. No. 11352-3.....	105.2	49.8	1054.3	1416.9	201.9	321.9
Residue 1449.0 gms. No. 11436.....	39.8	19.9	475.4	636.1	145.0	132.7
Eaten.....	65.4	29.9	578.9	780.8	56.9	189.2
Excreted 1005.5 gms. No. 11487.....	87.4	13.7	201.4	415.0	66.6	221.5
Digested.....	.....	16.2	377.5	365.8	0	0
Percentage digested.....	.....	54.2	65.2	46.8	0	0
Sheep No. 2—						
Fed 3150 gms.....	105.2	49.8	1054.3	1416.9	201.9	321.9
Residue 514.1 gms. No. 11437.....	11.0	7.2	173.9	219.9	50.9	51.2
Eaten.....	94.2	42.6	880.4	1197.0	151.0	270.7
Excreted 1287.8 gms. No. 11488.....	97.1	15.8	296.6	580.9	84.5	212.9
Digested.....	.....	26.8	583.8	616.1	66.5	57.8
Percentage digested from milo forage.....	0	62.9	66.3	51.5	44.0	21.4
Average percentage milo forage digested.....	0	56.6	65.8	49.2	.....	.....
Digestion Period No. 81 With Acuff Sorgo Forage.						
Sheep No. 2—						
Fed 3360 gms. No. 11438-9.....	136.8	45.7	1068.8	1473.7	248.0	387.1
Residue 398 gms. No. 11502.....	9.6	3.1	138.3	159.9	45.5	41.7
Eaten.....	127.2	42.6	930.5	1313.8	202.5	345.4
Excreted 1584.5 gms. No. 11524.....	112.5	27.6	351.4	686.7	107.9	298.4
Digested.....	14.7	15.0	579.1	627.1	94.6	47.0
Percentage digested.....	11.6	35.2	62.2	47.7	46.7	13.6

TABLE 8. NUTRIENTS FED, DIGESTED AND EXCRETED, IN GRAMS PER PERIOD
—Continued.

	Protein.	Ether extract.	Crude fiber.	Nitro- gen free extract.	Water.	Ash.
Sheep No. 3—						
Fed 3360 gms	136.8	45.7	1068.8	1473.7	248.0	387.1
Residue 200 gms. No. 11503	5.4	1.7	67.0	81.6	20.8	23.6
Eaten	131.4	44.0	1001.8	1392.1	227.2	363.5
Excreted 1867.5 gms. No. 11525	122.7	26.9	459.2	788.1	159.7	310.9
Digested	8.7	17.1	542.6	604.0	67.5	52.6
Percentage digested from Acuff sorgo forage	6.6	38.9	54.2	43.4	29.7	14.5
Average percentage Acuff sorgo forage digested	9.1	37.1	58.2	45.6	38.2	14.1
Digestion Period No. 82 With Rhodes Grass Hay.						
Sheep No. 1—						
Fed 4220 gms. No. 11504-5	228.5	70.6	1349.0	1808.9	302.4	440.6
Residue 1250 gms. No. 11561	62.1	18.5	402.0	548.8	97.3	121.4
Eaten	166.4	52.1	947.0	1360.1	205.1	319.2
Excreted 1216.5 gms. No. 11567	93.5	28.6	265.3	512.3	91.6	225.2
Digested	72.9	23.5	681.7	847.8	113.5	94.0
Percentage digested	43.8	45.1	72.0	62.3	55.3	29.4
Sheep No. 2—						
Fed 4200 gms. No. 11504-5	228.5	70.6	1349.0	1808.9	302.4	440.6
Residue 5 gms. ....	.3	.1	1.6	2.2	.4	.5
Eaten	228.2	70.5	1347.4	1806.7	302.0	440.1
Excreted 1941.8 gms. No. 11568	128.4	38.4	487.2	837.1	127.0	323.7
Digested	99.8	32.1	860.2	969.6	175.0	116.4
Percentage digested from Rhodes grass hay	43.7	45.5	63.8	53.7	57.9	26.4
Average percentage Rhodes grass hay digested	43.8	45.3	67.9	58.0	56.6	27.9

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SUMMARY AND CONCLUSIONS.

This bulletin contains information concerning the productive values and digestible protein of alfalfa hay, sorghum, corn, Bermuda hay, corn silage, cotton seed, *Dolichos lablab*, feterita, kafir, milo, moth bean, peanut hay, peanuts, prairie hay, Rhodes grass hay, rice, Shallu, sorghum, Sudan hay, and wheat shorts. The relative values of the feeding stuffs, the digestibility, the productive coefficient and the composition are shown in appropriate tables.

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